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**CMPX 2016
SHOW GUIDE**

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THE IOT**

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**THE PROS & CONS
OF COMMON
PIPING DESIGNS**

**THE DOWN SIDE OF
OVERSIZING**

**THE FLIPSIDE OF TIGHTER HOMES:
SHOULD HVAC
CONTRACTORS
PROMISE
QUALITY AIR?**

**ENERGY COST REDUCTION,
STANDARD COMPLIANCE:
HAVE IT ALL WITH
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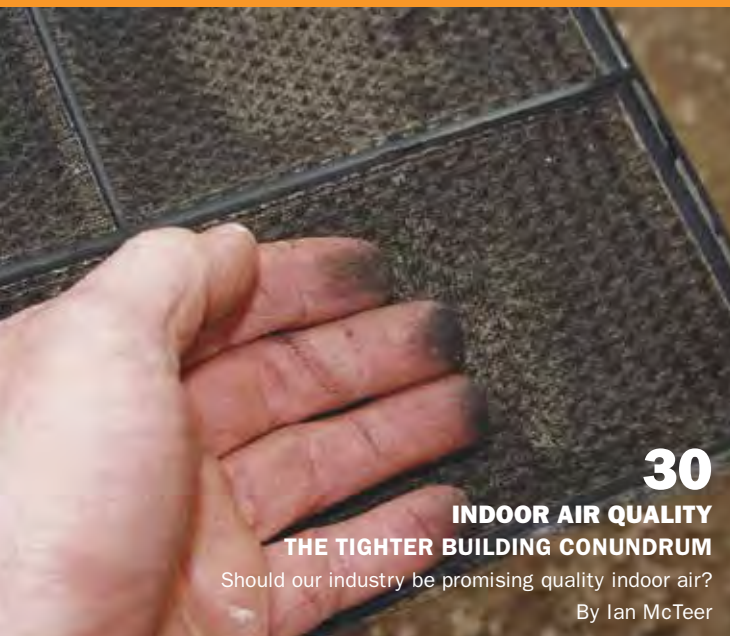
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**30****INDOOR AIR QUALITY
THE TIGHTER BUILDING CONUNDRUM**

Should our industry be promising quality indoor air?

By Ian McTeer

**40 RETROSPECTIVE
THE PLUMBER IS
NOT DAMNED!**

Mr. and Mrs. Consumer like him, but think he is missing bets by not trying to sell them what they need.

**44 SYSTEM DESIGN
DO THE MATH, TRUST THE MATH**

What is the down side of oversizing equipment? By Steve Goldie

**50 HYDRONICS
HEALTHY CIRCULATION**

It is time to get serious about water quality in every hydronic system.

By John Siegenthaler

**58****PLUMBING
GREASE LIGHTNING: HAVE
PRIDE IN THAT RIDE**

Are you up to speed on grease management?

By Andrew Bird

**64 TECHNOLOGY
THE INTERNET OF WHAT?**

Beyond the jargon; there is an opportunity for mechanical professionals who embrace IoT. By Beth McKay

**70 REFRIGERANTS
CO2 GETS A SECOND LIFE**

Whatever the refrigerant, we are still applying the same basic principles.

By Dave Demma

**78 SHOW PREVIEW
MEET SHOW'S 22ND EDITION
EXPECTED TO BE A RECORD
BREAKER****80 SHOW REPORT
WARMING TO THE BENEFITS OF GEOTHERMAL TECHNOLOGY**

The OGA seeks to change the perception of geothermal.

By Beth McKay

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86 SHOW REVIEW

THE MAGIC KINGDOM OF HVAC/R: ASHRAE ORLANDO 2016

Including quotes from industry pros on what wowed them at AHR/ASHRAE.

By Robert Bean



cmpx

Canadian Mechanical
& Plumbing Exposition

2016

91 INTRODUCTION,
HOURS AND HIGHLIGHTS

92 SEMINAR SCHEDULE

102 SPEAKER PROFILES

110 FLOOR PLAN

113 EXHIBITOR LIST

126 PRODUCT
SHOWCASE

150 PIPING

OPTIONS FOR MULTIPLE BOILER PLANTS

Make your best choice—understand the pros and cons of common designs. By Mike Miller



158 VENTILATION

MEETING THE CHALLENGE OF STANDARD COMPLIANCE AND ENERGY COST REDUCTION

Outdoor air ventilation seen as a means to curb incidents of hospital acquired infection. By Steve Ulm



162

PIPING

INOX – A FOUR LETTER ACRONYM FOR CHANGE

The stainless steel option and its influence on the design and installation of potable water systems.

By Mark Evans

164 MANAGEMENT

A LOOK AT THE BOTTOM LINE

What kind of business has the best sales appeal? By Mark Groulx



169 FINANCE

WHAT WILL THE IMPACT OF TAX CHANGES BE ON BUSINESS?

A dozen factors influencing taxation in the coming years.

By Hank Bulmash

DEPARTMENTS

8 Upfront

Researchers release interactive tool to visualize climate opinions across Canada

14 Industry News

152 Mechanical Supply News

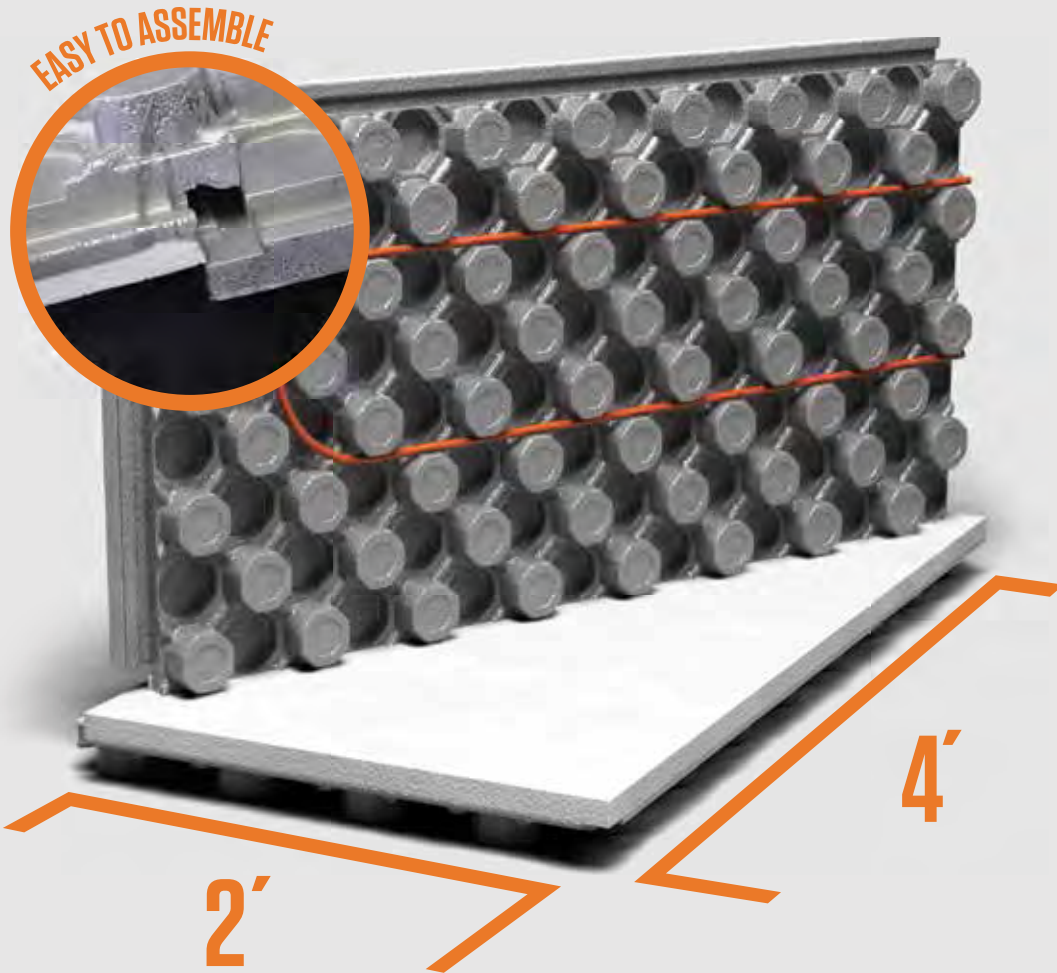
156 People

168 The Source

165 Training

167 Calendar

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Navien's Award Winning NCB Combi-boiler Evolves for 2016

Navien's NCB series is unique in that, as one unit, it is capable of providing a whole house heating system while also providing the domestic hot water output of a stand-alone tankless water heater. Proving that Navien engineers never rest on their laurels, the new NCB-E (E for evolves) will be a rolling replacement, now with a Grundfos pump, an integral air vent, a PRV top connection, a quieter fan and a new front cover bevel design.

Following the 2014 Canadian Institute of Plumbing & Heating Innovation Award at the MEET trade show of Mechanical, Electrical, Electronic Technologies in Moncton, NB, Canada, Navien's NCB Combi-boiler Series was voted #1 in the 2014 Comfortech Product Showcase Awards contest, in the category of Plumbing.

This follows Navien's motto of "Making the world more comfortable every day" said Eric Ashley, Marketing Product Supervisor for Navien.

Innovation: Dual inputs of 120k BTU/h of heating, 199k BTU/h of DHW capacity and the ability to link with NPE series tankless water heaters for expanded DHW delivery, featuring many firsts in the industry.

Value: The NCB-E series is priced competitively compared to other combination boilers but unlike others, the NCB-E series can deliver an impressive volume of domestic hot water to satisfy the demands of a large home. With an AFUE of 95%, the NCB carries the coveted Energy Star Most Efficient Rating.

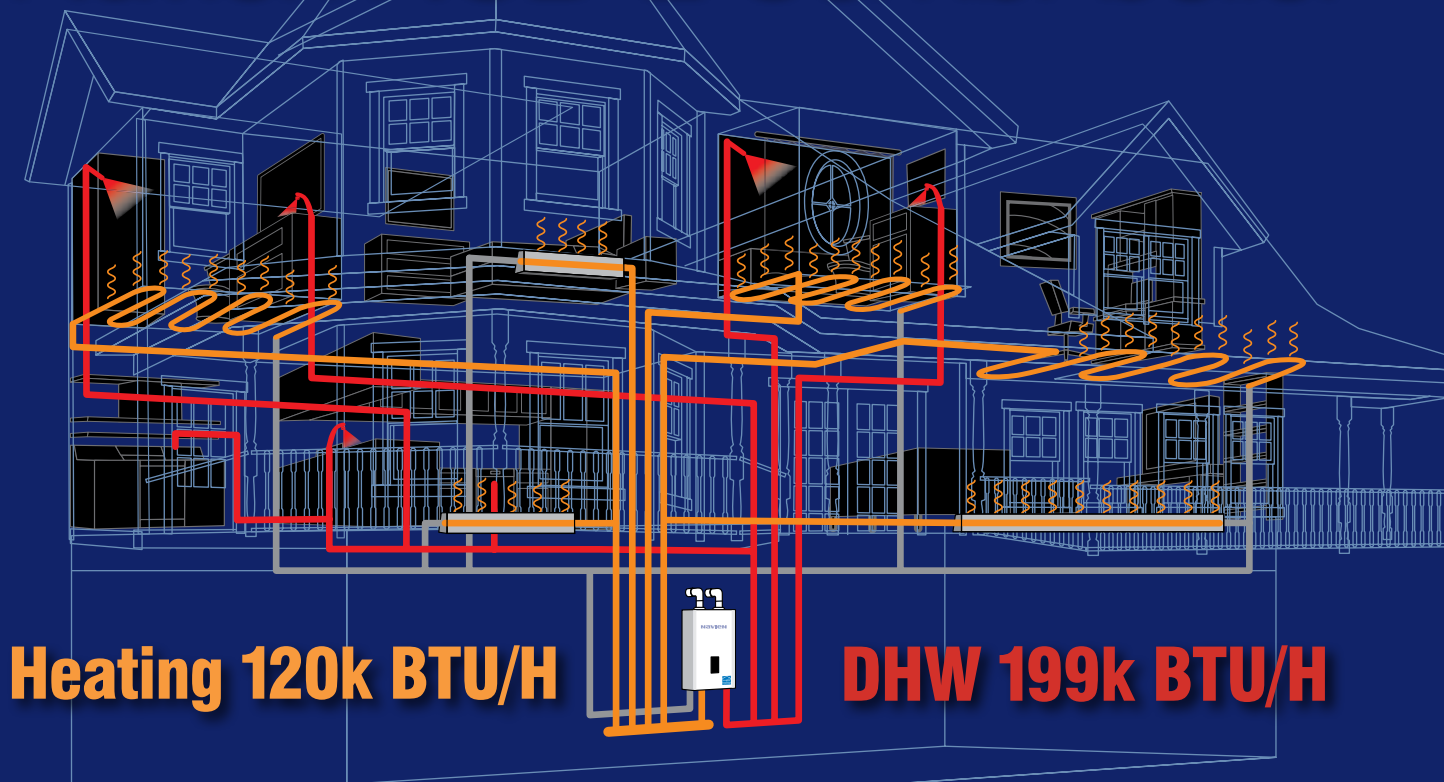
Market Impact: The NCB-E is capable of providing up to 120k BTU/h heating capacity, and an impressive 199k BTU/h of DHW capacity. The contractor can now offer a complete package for whole home heating as well as endless hot water to satisfy the lifestyle of consumers today.

Training on all Navien products is available throughout Canada. To this end, Navien has recently hired Leo Vaillancourt, a 44 year veteran in the plumbing and heating industry, as Trainer for Western Canada. Leo's knowledge and experience will help empower our customers to grow their businesses, says Mark Williamson, Navien's Canadian General Manager."

For more information on the new NCB-E series, visit www.WholeHouseCombi.com.



Navien NCB-E Combi-boiler



Whole house heating and DHW for larger homes all in one compact combination boiler



HTG&DHW
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STEEL
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Navien NCB-E is the high efficiency tankless condensing combination boiler with the capacity to supply both heat and DHW for larger homes — enough hydronic heat for the whole house, plus hot water to run two showers and a dishwasher at the same time.



Save installation time and reduce call backs, as your customers save energy and enjoy all the hot water they need, whenever they want it. **Now available in four sizes — NCB-150E, NCB-180E, NCB-210E and NCB-240E.**

To learn more visit WholeHouseCombi.com or Navien.com.

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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

FIND OUT WHAT YOUR FELLOW CANADIANS THINK ABOUT CLIMATE CHANGE

Just when you thought you had heard all the opinions you wanted to hear about climate change and some you did not (“It is all a hoax,” ala Donald Trump), you can now find out what fellow Canadians really think. Researchers from the Université de Montréal, the University of California Santa Barbara, Utah State University and Yale University have released an interactive tool to visualize the geographic distribution of climate opinions across Canada.

According to a release from the Université de Montréal, users can download the underlying estimates of public opinion for each province and riding in Canada with the Canadian Climate Opinion Maps (CCOM), which is available in English and in French. Created using a statistical model based on over 5000 responses to national surveys from 2011-2015, it reveals that, nationally, 79 per cent of Canadians believe that Earth is getting warmer, but the new public opinion maps show distinct differences among provinces and ridings.

Interestingly, not as many adults in Alberta believe this is the case (67 per cent) as believe it in Quebec (85 per cent). Within federal electoral districts, percentages vary from 56 per cent in the Souris-Moose Mountain riding in SK, to 91 per cent in the riding of Halifax, NS.

“Our research shows that across the country, a majority of Canadians are aware of the problem of rising global temperature on Earth, and many believe humans are directly contributing to this warming. This is true across Canadian regions and across the urban-rural divide as well,” said one of the project’s lead researchers, Université de Montréal professor Erick Lachapelle.

In terms of possible solutions for fighting climate change, the idea of implementing an emissions trading system enjoys popular support (66 per cent) across the country. A carbon tax is less popular nationally (49 per cent), with support for more carbon taxes also being much more variable across ridings.

“We always knew opinions varied across Canadian provinces. Now we see that urban-rural differences are just as important, if not more important features of Canadian public opinion on climate change,” said Lachapelle. “Of course, opinions and policy preferences are not uniform across the country. So this tool illustrates not only where climate policy support is concentrated, but perhaps more importantly, it depicts where enhanced outreach and engagement efforts are required to bring the public on side with what needs to happen.”

Readers can give it a try at <http://umontreal.ca/climat/engl/index.html>. Explore the maps and data by clicking on your province or riding, and compare results across questions, and with other geographic areas.

My favourite model output: *Earth is getting warmer mostly because of human activities*; it was interesting and fun to see how pockets of large centres could differ so significantly. My neighbourhood was +11 from national average—not surprising considering residents are often referred to as leftie tree huggers—affectionately of course.


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Thankfully, Zuba-Central is specifically designed for Canadian winters, so you get the benefits of a heat pump above 0°C, and all the way to -30°C and beyond.

The secret behind Zuba-Central



Zuba-Central provides you high-heating performance, even under extremely low outdoor temperatures, thanks to our efficient and exclusive Hyper-Heat Inverter (H²i) technology.

In addition, the unique defrost mechanism provides an extended period of continuous heating between the defrost time, and minimizes the defrost time required, proving yet again that Zuba-Central is one of the most efficient systems on the market.

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Taco Re-engineers itself as a Truly Global Brand

No longer simply a Heating and Cooling company Taco Inc. will now be known as: Taco Comfort Solutions, a Taco Company. This new name reflects our ongoing commitment to provide outstanding indoor comfort with high efficiency - to save both energy and resources.

The New Taco Group organization now includes: Hydroflo Pumps/Fluid Solutions of Fairview TN, Askoll/Taco Flow Solutions of Sandrigo, Italy and Taco Trading/Supply of Kowloon, Hong Kong. The Taco Group also includes Operations and Sales offices in the U.S., Canada, Panama, Italy, Dubai, South Korea, China and Vietnam. Truly a Global Brand.

Beyond Heating and Cooling, Taco has expanded Comfort Solutions to include the related fields of hydronics, electronic controls, valve tanks, pump heat exchangers, high efficiency circulator pumps and a host of ancillary products and accessories.

Taco Comfort Solutions. Now well positioned with global resources and innovative products to serve the world.

The legacy of the 00. The efficiency of ECM. 00e Series High-Efficient Circulators.

Setting new standards for efficiency in a proven family of products, all our 00e circulator pumps feature ECM technology. They use up to 85% less electricity than conventional pumps. These wet-rotor pumps are designed to perform in a wide variety of residential and commercial applications. And true to the 00 family heritage, they are designed to be simple to install, set-up and service.

The VR1816 for example combines efficiency and installation/set-up ease for residential needs. The VT2218 is the only Delta T variable-speed circulator in its class - delivering high efficiency right out of the box. And the VR3452 is designed for extended operating range in both chilled and hot water applications. An optional communications module allows for excellent flexibility. The VR15 to VR30 series have built-in web-enabled convenience for installation and set-up ease in both residential and commercial applications.

The New 00e pumps are part of our e-smart family of products. E-smart is our way to help clients identify our most resource-saving products.



THERE'S MORE TO CHOOSE FROM TACO

The hydronic systems experts

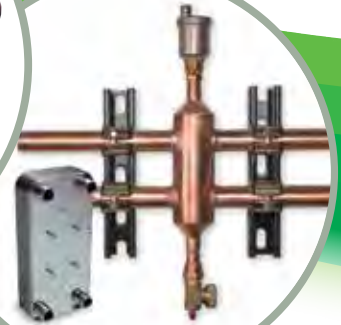
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We develop and manufacture a wide range of circulators; pumps; electronic, air and hydronic controls; heat exchangers; air-dirt separators; expansion tanks and valves. This represents the most comprehensive selection of hydronic system components available from a **single supplier**.

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- **HSPF of 12 in zone IV**
- **HeatExtrem is capable of producing heat at temperatures as low as -35°C**
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- **Energy Star and AHRI listed**
- **Limited warranty of 10 years**

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INDUSTRY NEWS

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The 2016 KBIS show in Las Vegas, NV.

THREE CANADIANS RECOGNIZED FOR EXEMPLARY DESIGN

The National Kitchen and Bath Association (NKBA) has announced the 2016 Design Competition Winners from the KBIS Show in Las Vegas, NV. The awards event was held on January 18, one day prior to the opening day of KBIS, and attracted nearly 400 industry professionals.

Over 30 individuals earned top honours across six main kitchen and bath categories and eight specialty categories. This year, three Canadians took home awards.

Cassandra Nordell-MacLean of William Standen Co. in Sarnia, ON, took home the award for Green Design. Allie Baxter, CKD, who is with Herringbone Interiors in Toronto ON, received an honourable mention for her powder room design. Vanessa Pinelli of Troico Home Solutions & Manufacturing Inc., in Coquitlam, BC also received an honourable mention for her small bathroom design. www.KBIS.com

BC SAFETY AUTHORITY'S 2016 TO 2018 BUSINESS PLAN AVAILABLE NOW

The BC Safety Authority's (BCSA) 2016 to 2018 business plan outlines its goals for the next three years and defines how it will measure success. The theme, Growing Participation, represents BCSA's business focus in the fourth year of its 10-year strategy. The business plan describes how it will deliver on its strategy by enhancing support for the integrity of the safety system.

Catherine Roome, BCSA president and CEO, said the BCSA would use technology tools to put more valuable safety information into the hands of employees, clients, stakeholders and the public. "The availability and exchange of this information will change behaviours in a predictable way, resulting in better safety," said Roome.

In 2016, BCSA will: expand and enhance client portal; expand the safety products and services it offers to asset/equipment owners; enhance technology infrastructure and processes for employees; expand and enhance its Resource Allocation Program (RAP); standardize and enhance its certification processes; and implement compliance and enforcement program improvements.

www.safetyauthority.ca

BC FIRM HONoured FOR INNOVATIVE PRODUCT

The 2016 AHR Expo in Orlando, FL in January attracted nearly 61 000 people from 67 countries, including 3500 Canadians. A highlight of the show, the Innovations Award competition, honoured inventive and original products, systems and technologies showcased at the event. Winners are chosen by a panel of third-party judges from ASHRAE.

International Wastewater Systems Inc. (IWS), which is headquartered in British Columbia, received a 2016 AHR Expo Innovation Award for Green Building Innovation. The product recognized was the Piranha wastewater heat recovery heat pump, which is a self-contained heat pump that extracts thermal energy from wastewater for domestic hot water production.

Other Innovation Award winners included: Aeroseal in the ventilation category; Accutrol in the building automation category; Sporlan-Parker Hannifin in the cooling, and tools and instruments categories; Victaulic in the heating category; Semco in the indoor air quality, and plumbing categories; Carel



ASHRAE president David Underwood (l) with Nicolas Lemire, Ing., HFDP, president/principal, Pageau Morel and Associates, Montreal, QC.



The 2016 AHR Expo in Orlando, FL featured 334 first time exhibitors.

Industries in the refrigeration category; and Plasma Air International in the software category.

The 2016 ASHRAE Winter conference, which took place simultaneously, attracted 3000 guests between January 23 to 27. An ASHRAE Technology Award was presented to Nicolas Lemire, Ing., HFDP, president/principal, Pageau Morel and Associates, Montreal, QC in the new educational facilities category for the Anne-Marie

Edward Science Building at John Abbott College, Saint-Anne-De-Bellevue, QC. This award recognizes outstanding achievements by ASHRAE members who have successfully applied innovative building design.

For Robert Bean's perspective on the ASHRAE conference and highlights of the event, see page 86.

www.ahrexpo.com

AMENDMENTS TO SASKPOWER GAS INSPECTIONS REGULATIONS

Effective December 11, 2015, Saskatchewan Cabinet approved two amendments to the Gas Inspection Regulations. The maximum penalty that may be imposed for performing gas installation work without a permit (section 13.1) increased from \$250 to \$2500 for each item of work performed without a permit.

SaskPower also adopted the following documents (section 16(1)) as standards for the installation of equipment under specific circumstances.

The additions include: CSA-B149.1-15: Natural Gas and Propane Installation Code; CSA-B149.2-15: Propane Storage and Handling Code; CSA-149.6-15: Code for Biogas Generation and Utilization; CSA-B108-14: Compressed Natural Gas Fuelling Stations Installation Code; CSA-B149.3-15: Code for the Field Approval of Fuel-Related Components on Appliances and Equipment; CAN/BNQ/1784-000/2007: Canadian Hydrogen Installation Code; and CSA-B149.5-15: Installation Code for Propane Fuel Systems and Containers on Motor Vehicles.

As previously announced in Bulletin 01-2015, the Saskatchewan adoption of the 2015 CSA B149.1, CSA B149.2 and CSA B149.3 gas codes will be enforced on permits dated on or after January 1, 2016. www.saskpower.com

continued on 18



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Viega MegaPress® Brings Innovative Press Technology to Black Iron Pipe

Viega's innovative press technology revolutionized plumbing, heating and pipe joining systems worldwide when Viega ProPress® was introduced to the Americas in 1999. With the introduction of the Viega MegaPress system for black iron pipe, Viega has once again changed the pipe joining market. Viega MegaPress brings press technology to black iron pipe, making secure, water- and air-tight press connections in less than seven seconds on Schedule 5 to Schedule 40 black iron pipe in sizes ½" to 2".

The Viega MegaPress system uses modern cold-press connections for pipe installation. Viega MegaPress is ideal for hydronic heat, chilled water, compressed air, fire protection systems, low pressure steam and vacuum lines. Viega MegaPressG is the only press pipe joining system designed for use in natural gas applications.

More than 200 engineered fitting configurations are available with the patented Smart Connect® feature, available only from Viega, which provides installers added confidence in the integrity of their connections. The system uses a stainless steel grip ring with an EPDM sealing element for Viega MegaPress or an HNBR sealing element for Viega MegaPressG, along with a stainless steel grip ring to perform at maximum capacity.

Not only does Viega MegaPress provide a fast, reliable way to join black iron pipe, this innovative addition to Viega's product line leaves no joining material build up, exposed threads or tarnish, creating a clean, professional appearance. The Viega MegaPress system uses the same versatile pressing tools already used by many contractors and maintenance staff. The pressing tools eliminate the need for expensive and cumbersome equipment including welding tanks and threading machines.

Ideal for industrial, commercial and residential applications, the Viega MegaPress system is easy to use, flameless and environmentally friendly. The system performs well in both new installations and retrofit projects.



Viega system solutions

The right choice for commercial properties

“Our standard is Viega ProPress®. It’s turned out to be one of the best plumbing innovations I have had the pleasure to work with.”

Fred Morissette
Southland Industries

The Smart Connect® feature provides installers added confidence in their ability to ensure the integrity of connections

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**CGC AND CIET
PARTNER FOR
GEOTHERMAL
TRAINING**



The Canadian GeoExchange Coalition (CGC) has announced that it has entered into a partnership with the Canadian Institute for Energy Training (CIET) for delivery of its four-day CGC Commercial Designer's Course across Canada.

Patrick Lambert of Geo-Energie Inc. will be the course instructor. The first training sessions will be offered on June 6 to 9 in Montreal, QC and on June 13 to 16 in Toronto, ON.

www.cietcanada.com
www.geoexchange.ca

BUILDEX EXPRESS

**CIPHEX WEST
AND BUILDEX
EXPRESS TO
CO-LOCATE**



CIPHEX West and BUILDEX Express are co-locating at the Vancouver Convention Centre in Vancouver, BC for their November 2016 shows.

CIPHEX West is a two-day trade show and conference that is produced by the Canadian Institute of Plumbing and Heating (CIPH), and is slated for November 2 and 3. BUILDEX Express, which is produced by Informa, is an event for the construction property management, interior design and architecture industries that is being held on November 3.

CIPHEX will have over 30 000 square feet of exhibits and will feature a full conference program, a new product showcase, the Canadian Hydronics Conference and the new Executive Summit. www.ciphwest.ca
www.buildexvancouver.com

GTA CHAPTER MEETING FEATURES TSSA'S SAT VIRDI

On January 26, the Heating Refrigeration and Air Conditioning Institute held its Greater Toronto Area chapter meeting in Vaughan, ON. The evening event attracted nearly 60 guests and featured speakers Karin Fahey, strategic account manager with CSA Group and Sat Virdi, regional supervisor for Technical Standards & Safety Authority (TSSA).

Fahey discussed the CSA app and used the B149.1 – Natural Gas and Propane Installation Code, as an example of how interactive standards work. Interactive Standards for codes offer an e-book format that is optimized for a tablet device and scalable to smaller screen devices as well. They feature a quick reference capability and a search by rule, topic or keyword option. The CSA app is available through the Apple Store.

Chapter meeting guests expressed some concern as to whether the interactive format of the Code is acceptable for field professionals to have onsite rather than a printed hard copy. John Marshall, director, TSSA told HPAC after the meeting, "It is acceptable to have and use an electronic version of the code. However, the field personnel must have access to the code at all times through a mobile device while on any job site."

Following Fahey's presentation, Virdi's discussion revolved around compliance to rules and codes in the workspace. He shared two case studies and a number of examples where contractors disregarded obvious red flag situations as well as their training.

Virdi focussed the first half of his presentation on gas leaks, showing a photo of a contractor searching for a gas leak with a lighter. "How do you stop that?" he asked, noting that this contractor was putting lives at risk by not being compliant.

A discussion surrounding gas leaks progressed into the importance of having a locate of gas pipes prior to digging. Although presenting a locate is not a new law, Virdi said it is still not being complied with. "With any excavation of the ground, you are breaking the law without a locate to show," he said. Virdi explained that locates are not difficult to obtain, and receiving one is a free service.

Virdi encouraged contractors to ask themselves, "Why am I here, and what are my options," when arriving at a jobsite. Answering these questions will help to keep contractors out of troubling situations, according to Verdi.

The chapter meetings run to May and again in October and November.
www.hrai.ca



The latest logo for the On1Call program.

**ENVISIONER OF THE
YEAR DEADLINE IN MAY**

Danfoss is accepting entries for its seventh annual EnVisioneer of the Year award competition. The competition recognizes North American original equipment manufacturers (OEMs), building owners, municipalities, contractors and end users that have introduced a new product, opened a new facility or have invested in a building or

system upgrade in the past 18 months using Danfoss products or solutions to realize significant energy and environmental savings.

Participants must submit an application to enter by May 1, 2016 through the company's website. Applications will be reviewed and selected by a panel of third-party judges.

www.danfoss.us.com

continued on 22



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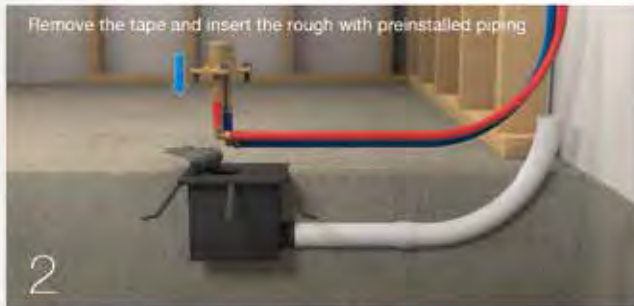
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Come visit us at the **CMPX** show in Toronto, booth **314** and meet Alexandre Tagliani, NASCAR racer, on March 16, between 9 am and 4 pm. Try to beat his time at the pit stop challenge!



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MCA Canada's national conference opening night in Palm Springs, CA.

PROMPT PAYMENT A PRIORITY FOR NEW MCA CANADA PRESIDENT

MCA Canada's 74th Annual National Conference, entitled The Heat is On, was held in Palm Springs, CA from November 16 to 19, 2015. The event offered educational programs, workshops and social events, including the

John Bradshaw Memorial Golf Tournament and an opening night party.

Gaetan Beaulieu, outgoing MCA Canada chairman, delivered a report to delegates on the 18th. He said, "The MCA Canada is successful as a national association because of the strength and commitment of the members of its board of directors. I can tell you from personal experience that their priorities are perfectly aligned with those of our members."

The conference also featured MCA Canada's first Awards Gala. Peter Ashton, immediate past chairman, Masco Canada, received the Doug Crawford Memorial Award. MCA America was recognized for its contribution to Operation Eyesight, and 100 Year Awards were presented to AON Insurance, A.O. Smith, Total Energy Systems and Wolseley Mechanical Group, as these companies are celebrating their 100th year in business.

Certificates of Appreciation were given to A.O. Smith, Bradford White, Apollo Valves, Taco Canada and IPEX.

The Gary Greig Memorial Award was presented to MCA Newfoundland and Labrador manager Dave Dawe. This award recognizes an individual(s) or company who has made significant and meritorious contributions to MCA Canada through long-standing voluntary participation, leadership and commitment to ensuring the success of the annual national conference.

At the annual general meeting on November 18, newly-elected MCA Canada president Del Pawliuk noted that his main concern to address in the role is prompt payment.

"I hope that we have prompt payment legislation enacted at the federal government level, and I believe



Kevin Fullan, Wolseley, is now vice chairman on the MCA Canada Associate Council Executive.

INDUSTRY TRAINER LAUNCHES SOLAR WATER SERVICES COMPANY



Solar Water Services Inc., a new company designed to help clients develop, implement and manage customized training solutions, opened its doors in January of this year. The company, which is located in Guelph, ON, offers consulting services, product management and content development related to hydronic and solar heating systems.

Company founder, Rob Waters, has over 30 years of experience in the hydronic and solar thermal industries, and was most recently with Viessmann. Over the past three decades, Waters has delivered over 1000 seminar days.

Solar Water Services offers part- or full-day training courses and Waters has experience with large and small groups. Both in-class and online sessions are available. For details, tel. 519.835.8486 or e-mail solwatservices@gmail.com.

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continued on 26

AquaPLEX - Not your Ordinary Stainless Steel Tank

PVI AquaPLEX domestic hot water heaters and tanks are constructed from duplex stainless steel, an alloy that combines the grain structures of 300-series and 400-series stainless steels and provides the benefits of both. After welding is completed; the tanks are pickle-passivated to deep-clean the material to its original pristine condition and allow the recreation of a corrosion resistant chromium oxide layer on its surface. AquaPLEX is ideal for potable water heating applications because the alloy is highly resistant to general aqueous corrosion in addition to being resistant to stress corrosion cracking, which can occur with 300 series stainless steels when dissolved chloride salts are present in the water supply. This inherent corrosion resistance results in tanks that require no supplemental lining and no anode rods of any type, regardless of stored water temperature. Warranties up to 25 years are available.



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**Up to 99% thermal efficiency. No glass lining failures.
15-year corrosion warranty.**



15-year tank and heat exchanger warranty

CONQUEST® Condensing Water Heater

- Tank and heat exchanger are made from AquaPLEX® duplex stainless steel alloy. Fully pickle-passivated, AquaPLEX is immune to corrosion in potable water regardless of temperature and requires no lining or anodes of any type
- Up to 96% thermal efficiency at full-fire from 70°F to 140°F
- Seamless modulation improves efficiency to 99% during periods of low demand
- Electronic operator with digital temperature readouts and plain text for status, diagnostics and 15-event history. Includes Modbus for BAS connection

Conquest water heaters are available from 199 to 800 MBH in tanks from 100 to 130 gallons. Heaters are ASME code stamped.



Engineered Water Heating Solutions®



www.pvi.com



TriangleTube

New & Improved Products for 2016



Prestige High Efficiency Condensing Gas Boilers & Combi Units

Prestige Boilers: Our flagship line of premium, condensing, firetube gas boilers extends from 80 to 399 MBH. Two new models were added to this range, 155 and 299, for a total of 7 to cover any application. The entire range features 95-plus percent efficiency and up to 5.5:1 turndown ratio. The new ACVMax Control system includes a mixing valve function for dual temperature heating systems as well as fully programmable circulator control. Many other improvements have been made for better reliability, operation, and serviceability.

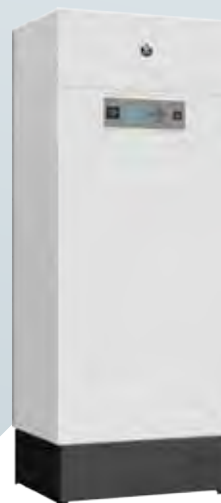
ACVMax Control Features:



- > 60 Second Set-up Based on Former TriMax Platform
- > Integrated Cascade Function for up to 6 Boilers
- > Two Reset Curves / Set Points
- > Multiple Zone Control
- > Multiple Circulator Control

HeatMaster® TC & WaterMaster Floor Standing Total Condensing Boilers & Water Heaters

HeatMaster® TC and WaterMaster TC: Announcing a new family of floorstanding, condensing combi gas boilers and water heaters. These units range from 85 to 399 MBH with industry leading water output and utilize the new ACVMax Control allowing cascading of up to 6 units. The unique heat exchanger design maximizes hot water output while maintaining very high efficiencies.



Marquis High Efficiency Condensing Tankless Water Heaters

Marquis Tankless Water Heaters: Our high efficiency instantaneous water heater line now includes three models ranging from 150 to 199 MBH. The Marquis boasts up to a 10:1 turndown ratio, gas leak detection, cascading up to 20 units for commercial applications, and Energy Factor (EF) ratings as high as 0.97!



Keystone High Efficiency Condensing Commercial Boilers & Water Heaters

Keystone Condensing Boilers and Water Heaters: Introducing two new models of boilers and water heaters to extend the range all the way up to 1,200 MBH. All models now feature a color touchscreen for ease of use as well as a Modbus interface for BAS systems. Up to eight units can be cascaded together providing up to 4,800 MBH without the need for external controllers. Thermal efficiencies reach as high as 97 percent!



SMART & COMFORT Line Indirect Water Heaters

SMART & COMFORT IDWH: Our indirect water heaters have been upgraded with new domed tops, robotic laser welds, and new insulation resulting in a 40% greater insulating value.





Gaetan Beaulieu (l), MCA Canada's past chairman, passes the buck to Del Pawliuk (r), president, MCA Canada, at the National Conference closing gala.

that once that's in place, the provinces will follow suit," said Pawliuk.

MCA Canada's 2017 annual national

conference will be held in Orlando, FL at the Yacht and Beach Club Resort from November 14 to 17.

www.mcac.ca

UNDERSTANDING ONTARIO ENERGY EFFICIENCY AMENDMENTS

The Canadian Institute of Plumbing & Heating (CIPH) recently sponsored a webinar entitled "Understanding the Amendment to Ontario's Energy Efficiency Regulation." The presentation featured speakers from the ministry of Municipal

Affairs and Housing (MMAH), and the Ontario Ministry of Energy.

Senka Krsikapa, who is manager, energy efficiency standards, Ontario Ministry of Energy provided an overview of the most recent amendment to Ontario's energy efficiency regulation, O. Reg. 404/12. Changes in the amendment Reg. 412/15 include four additional products and revisions to 14 existing products.

Products that are of interest to the HVAC industry and that have a rolling incorporation with regulations from a



MONCTON, NB TO HOST 2016 SKILLS CANADA NATIONAL COMPETITION

The Skills Canada National Competition (SCNC) is scheduled for June 5-8, 2016 at the Moncton Coliseum in Moncton, NB. The event highlights over 40 skill areas with 500 young competi-

tors from all regions across Canada participating. It features a dedicated "Career Zone," which includes over 60 exhibit booths and interactive activities, and sponsored Try-A-Trade and Technology activities.

There will also be an Essential Skills Youth Forum for young adults aged 18 to 22 encouraging discussion on current Skills/Compétences Canada (SCC) programming. Admission to the competition is free and it is open to the public. www.skillscompetencescanada.com

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jurisdiction outside Canada include: refrigerated bottled or canned beverage vending machines (compliance date of July 1, 2016); commercial automatic ice makers (compliance date of January 28, 2018); walk in freezers and coolers (compliance date of June 5, 2017); furnace fans (compliance date of July 3, 2019); computer room air conditioners (compliance date of July 1, 2016); room air conditioner, (compliance date of January 1, 2017); and central air conditioner or heat pump <19 kW, liquid-to-air or evaporatively-cooled units (compliance date of July 1, 2016).

HVAC related products that do not have rolling incorporation and instead have new Minimum Energy Performance Standards (MEPS) include: furnaces, gas-fired, input less than 65.92 kW for mobile homes and units with integrated cooling component (compliance date of July 1, 2016);

liquid to air geothermal heat pumps (compliance date of January 1, 2018); water chillers (compliance date of January 1, 2017); residential water heater, gas fired tank type not more than 22 kW (compliance date of April 1, 2016); and small and large gas fired commercial boilers (compliance date of January 1, 2017).

The second presenter, Danny Hui, building code advisor, Building & Development Branch, ON, for MMAH discussed certain provisions of the Building Code – Part 12.

He noted that for current applicable MMAH Supplementary Standard SB-10 Documents, users must have the September 14, 2012 update and for the MMAH Supplementary Standard SB-12 Documents, users must have the September 2, 2014 update, as all others are out of date.

The Supplementary Standard SB-10 contains five divisions that address


general application of energy efficiency building design, prescriptive energy efficiency design criteria that also describes limitations on peak electrical demand and annual carbon dioxide emissions. It also contains simplified energy efficiency requirements for the construction of certain Part 9 non-residential buildings that are not using electric space heating.

The Supplementary Standard SB-12 contains three chapters: general; acceptable solutions for achieving energy efficiency compliance for permits applied for before January 1, 2017; and acceptable solutions for achieving energy efficiency compliance for permits applied for after December 31, 2016. www.ciph.com

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The five-layer PE-RT pipe consists of a layer of ethylene vinyl alcohol polymer (EVOH) sandwiched between two layers of DOWLEX™ 2344 Polyethylene Copolymer Resin and two layers of adhesive. This structure provides the outstanding long-term hydrostatic design strength demanded by hydronic heating applications.

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X-PERT S5® Radiant Tubing

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Bradford White's hydronic boilers and volume water heaters are available in a wide range of sizes and are suitable for nearly every application. Our comprehensive lineup includes products with inputs of 50,000 to 4,000,000 BTU/Hr. and thermal efficiencies as high as 98%.

The Brute™ Mini offers a simple design and compact size to improve comfort in nearly any residential system. The Brute™ Mini has a draft diverter and vent damper to conserve heat and boost efficiency.

Brute™ Series boilers are available in inputs from 80 to 850 MBH and are well-suited for residential and commercial applications.

The Wall Mounted Brute™ LX offers reliable space heating and hot water for practically any size home. Its fully modulating (20% to 100%) performance maximizes fuel efficiency.

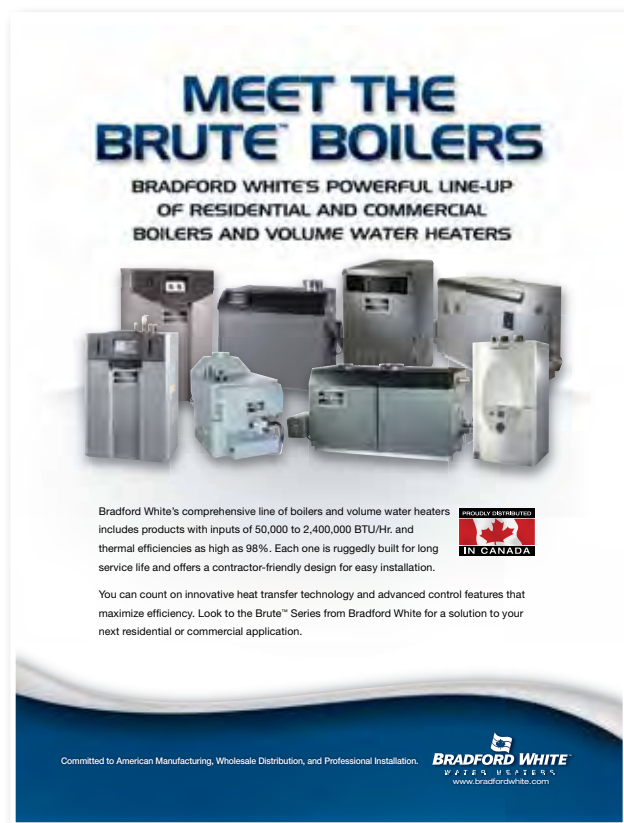
Brute™ 1000 & 1200 boilers operate at firing rates as low as 100,000 MBH, resulting in thermal efficiencies as high as 99%. The Brute™ 1000 & 1200's two equally sized burners can modulate independently.

The Brute™ Deluxe is available in inputs from 500 to 2000 MBH. Its contractor-friendly design includes easy wiring and controls that simplify installation in new and existing heating systems.

Available in inputs from 500 to 2000 MBH, **the Copper Brute™ II** can be vented as a Cat I appliance or as a Cat III appliance with horizontal venting lengths up to 50 feet. **Copper Brute™ II Low Temp models** feature an automatic bypass system that will maintain a minimum return temperature of 120°F (49°C).

The Brute MagnaTech™ offers a small footprint, slim vertical design, and removable top section, making it ideal for tight mechanical rooms. Inputs range from 1.6 to 4.0 million BTUs.

Bradford White **Residential and Commercial Storage Tanks** are the perfect addition to a Bradford White boiler or volume water heater when large volumes of hot water are required. Residential models are available in capacities from 40 to 120 gallons. Commercial tanks are available in standard sizes ranging from 175 to 5,695 gallons. With multiple connection, interior lining, and exterior coating options, Bradford White storage and buffer tanks can be configured for nearly every application. Custom sizes are also available.



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Bradford White's comprehensive line of boilers and volume water heaters includes products with inputs of 50,000 to 2,400,000 BTU/Hr. and thermal efficiencies as high as 98%. Each one is ruggedly built for long service life and offers a contractor-friendly design for easy installation.

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The Combi1™ features a single-wall heat exchange coil while the Combi2™ features a double-wall heat exchange coil. Both are Vitraglas® coated for corrosion resistance and long life.

Combi™ Series models are well-suited for supplemental heating applications as well as installations that utilize fan coils, space heaters, and radiant panels.

Combi™ models also feature the Hydrojet® Total Performance System, Vitraglas® tank lining and heat exchange coil coating, the ICON System™ intelligent gas control, and offer up to a 10 GPM flow rate with less than 5 ft. of head loss.

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The tighter building conundrum

Should our industry be promising quality indoor air?

BY IAN MCTEER

We moved to Toronto from Calgary in 1958. My father rented a nice apartment on the second floor of a low-rise building near Yonge and St. Clair. On occasion in the winter it would be necessary to open several windows quite wide because the room temperature would climb to equatorial levels. However, my fondest memories come from the Tesla-like electric shocks I was able to administer to my sister that would send her screaming into the next room. Of course, I do suppress the memories of her hitting me over the head with schoolbooks and the embarrassing self-inflicted static shocks. Suffering all of winter's extremes seemed to be inevitable; something one took for granted. Indoor air quality was an unknown entity.



Long-term candle burning (especially paraffin candles with poorly maintained wicks) puts soot throughout the building, damaging HVAC equipment, furnishings and, ultimately, the health of building inhabitants. In an eco-tight Passivhaus building it could have disastrous ramifications.

ENERGY CONSERVATION SINCE 1973

The idea of conserving energy, especially fossil fuels, began in earnest after a political squabble in the Middle East caused the OPEC oil cartel to cut-off oil deliveries to the U.S. market starting in October 1973. Having to live on roughly 25 per cent less oil resulted in gasoline rationing, a particularly bitter pill for American gasoline-powered mobility to swallow. Since 1973, the world has been worried about “peak oil,” the notion that we are quickly running out of fossil fuel resources and must turn to more sustainable sources such as solar power. However, a crazy thing happened on the way to the fossil-fuel hell hole: fracking technology has unleashed gushers of new oil in the U.S. making it almost self-sufficient in oil once again. There is so much oil sloshing around out there that instead of \$200 a barrel for oil predicted by the doomsayers, we are at \$30 a barrel today. Many of the high cost oil producers are out of business; tens of thousands of Canadian oil-patch workers have lost their jobs. So, run out and buy an SUV; crank up that smart thermostat until it threatens to report you to the RCMP; put Canadian oil workers back to work! Oh wait, we can't do that, there is another big problem called: Climate Change. It is a Google car and Passivhaus for you.

BATTEN DOWN THE HATCHES

For years we have been steadily tightening-up residential buildings. The R2000 program and the HOT2000 software have been around since the 1980s. The province of Ontario incorporated a performance-orientated chapter into its building code known as Part 12 in 2007. All across Canada, municipalities are just as concerned about energy efficiency as they are about building safety. Modern housing should have less conductive heat loss.

On his website, www.healthyheating.com, Robert Bean reminds us that experiencing our indoor space is a package deal he calls Indoor Environmental Quality (IEQ). IEQ consists of six metrics:

IEQ = TCQ + IAQ + ISQ + ILQ + IOQ + IVQ

TCQ = Thermal comfort quality

IAQ = Indoor air quality

ISQ = Indoor sound quality

ILQ = Indoor lighting quality

IOQ = Indoor odour quality

IVQ = Indoor vibration quality

Perhaps other than ILQ, our industry is responsible for providing the best possible base IEQ that is affordable, well suited to the application and user friendly. As we continue

Figure 1 Corrosive chemical contaminants

- Permanent wave solutions
- Chlorinated waxes and cleaners
- Chlorine based swimming pool chemicals
- Water softening chemicals
- Deicing salts or chemicals
- Carbon Tetrachloride
- Cleaning solvents such as perchloroethylene
- Printing inks
- Paint, paint removers, varnish, shellac, and so on
- Hydrochloric acid
- Cements and glues
- Antistatic fabric softeners for clothes dryers
- Masonry acid washing materials



Burning candles creates smoke full of soot. Use candles for short-term romantic occasions, parties/rituals and emergencies.

to fight climate change, providing an acceptable IEQ in exceptionally tight, energy efficient buildings is an enormous challenge for our industry.

TEETHING TROUBLES

Newspaper and internet articles regularly discuss IEQ going seriously wrong in Europe and North America. One recent story by Emily Hill in the British publication *The Spectator*, told of the “eco-home hell” that Emily and other tenants suffer due to excessive heat in the units during the spring and summer months.

“True, I’ve not turned on a radiator for two years – but in spring and summer it’s miserably, and sometimes dangerously, hot,” she said. Emily needs mechanical cooling, there is no way ventilation alone can keep her comfortable.

The State of New York Home Performance With Energy Star Program sent a note to participating contractors last December stating “recent research has revealed that a high percentage of completed projects in the Home Performance with ENERGY STAR program do not meet the savings projected during modelling.”

A report in the DutchNews.nl claims, “Modern and well-maintained central heating boilers are more likely to cause carbon monoxide poisoning than old boilers, the Dutch safety board said...in accidents involving carbon monoxide, 46 per cent are caused by heating systems, most of which are new or maintained by a professional, the board said.”

MISSION IMPOSSIBLE?

I struggle with the word “quality” as applied to indoor air because it implies a definable standard against which an HVAC contractor could possibly model a path to remediation suitable to any particular customer. However, there is no CSA standard denoting the ideal indoor environment.

My old chemistry text book says air should be roughly 78

per cent nitrogen, 21 per cent oxygen and about one per cent of trace gases, such as: hydrogen, carbon dioxide, xenon, helium, argon and others. We know that air contains many, many other gases, chemicals and particulates.

Consider the list of corrosive chemical contaminants shown in *Figure 1*. None of the contaminants in *Figure 1* can be included in the combustion air of a furnace or boiler. Exposure to these chemicals in the air will ruin a heat exchanger in short order, never mind what they can do to one’s physiology.

I have been in thousands of homes across Canada. I said earlier that our industry must provide a “base IEQ” simply because once humans occupy a space, no two houses will be the same when it comes to what is floating around in the indoor air. People have hobbies and crafts; I have seen machine shops with metal lathes, drill presses, parts washers;



Ventless appliances reduce the ventilation load, however, this clothes drier dumps a considerable amount of heat back into the room. Passivhaus eco-buildings with ventless appliances will roast inhabitants unless companion mechanical cooling is provided. Non-potable water removed from clothing can be collected in the tank and used for watering plants.



Exterior Line Set Protection Products

Carlisle HVAC Products' high-performance Exterior Line Set Protection products can be used in a wide variety of applications to provide a professional finished look that meets code requirements. Our TPO-2265 provides excellent protection from UV rays, moisture, wind, and landscaping operations, while our SEAL-TACK™ coats foam insulation and protects against mold, mildew, and severe weather.

Carlisle's TPO Line Set Wrap provides excellent protection from UV rays, moisture, wind, and landscaping operations. High-performance, dimensionally stable TPO Line Set Wrap also offers a quick, labour-saving application: simply apply to the exterior of the pipe wrap insulation and peel off the release liner for an aesthetically pleasing, professional finished look that meets code requirements.

Carlisle's White Seal-Tack is specially designed to coat foam insulation and protect against UV damage, moisture, mold and mildew, and severe weather. Water-based, non-flammable Seal-Tack can be applied in a wide range of temperatures and conditions and is ideal for both outdoor and indoor line set protection. White Seal-Tack meets code requirements and its application flexibility makes it ideal for virtually any project.

Call 888-654-7439 today for more information.



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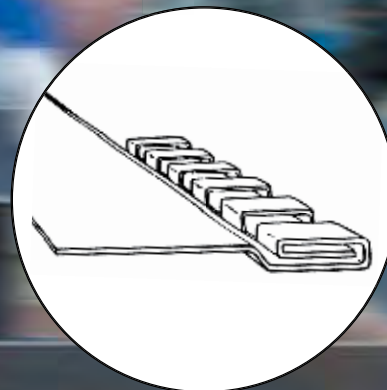
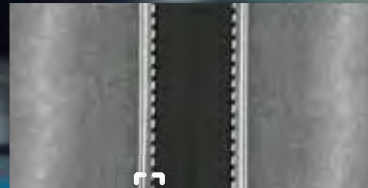
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Concentric furnace vent, HRV exhaust and inlet terminals arranged in an idyllic setting. This is not always available in urban areas where lot lines are tight and basements are completely submerged in the ground allowing snow accumulation to bury the termination. HRV inlets can be easily exposed the neighbour's smoking BBQ or idling diesel truck.



Install cabinet-style air filters horizontally wherever possible to improve serviceability and remove the need for turning vanes in the return air boot. Installing a low initial ΔP filter means less energy is required to move air through the system.

motorcycles and boat motors; woodworking shops; pottery and pottery kilns; hair dressing; pet care; and home offices. I have seen piles of trash, hundreds of rotting newspapers piled up; some people still smoke various substances indoors; many people burn scented petroleum and beeswax candles; and I have encountered single family homes with several families living in them. People literally torture their HVAC systems and it could be dangerous for some people to occupy a residence tightened-up to modern building codes. It really is impossible to provide a decent IEQ with all this stuff going on.

AIR EXHAUSTING APPLIANCES

In the December 2015 issue of *HPAC*, Robert Bean's article, "The Essential Ingredients" asked the question: how much is enough when it comes to providing proper kitchen exhaust. People love to cook, especially with gas, but cooks are oblivious to the effects of radical depressurization and simply want the fumes to disappear. Bean's guidance on this topic is a must-read for all new installations done by professional contractors.

But kitchen exhaust has turned into a DIY project, it seems. It is sadly amusing to watch television reality renovation programs in which gas stoves, along with industrial strength range hoods, are installed into improper duct systems by renovation enthusiasts. The local home improvement store has plenty of 220 cfm range hoods in stock readily available for the DIYer to put himself at risk.

In the TSSA Fuels Edition "Update" pamphlet, Volume 8, Fall 2010, Zenon Fraczkowski (senior engineer) discussed minimum clearances to combustible material for gas or LP fired stoves: "What TSSA is finding now are very elaborate custom-designed vent hoods over gas ranges that are

closer than the required 76.2 cm above the range."

Zenon went on to point out that it is "the gas technician's responsibility and ultimate accountability to install appliances in accordance with the code requirements and certified installation instructions." Thus, a gas stove with a range hood can easily be a fire hazard and an IEQ nightmare at the same time. HVAC technicians beware: this is on you! Perhaps the kitchen and craft rooms should be in a separate out-building; I know, who is going to pay for that.

HEAT RECOVERY VENTILATORS

Tight construction requires mechanical ventilation. Unless you have completed an HRAI Skilltech or community college program, you are not qualified to specify or to install a heat recovery ventilator (HRV). I bought a house built in 2005 that is fairly tight: at -27C last winter I still had 25 per cent RH in the house and struggled to keep the windows dry. The builder-installed HRV was a decent product, but was not installed properly, not commissioned properly (no evidence of balancing) and never maintained. I managed to get it going but it was replaced this summer. That replacement project was a story onto itself.

AIR FILTERS

An effective air filter (MERV 11 minimum) is required in every air handling system to keep the blower wheel, secondary heat exchanger (if equipped) and evaporator coil clean. Clean components mean system efficiency is retained longer, failures are reduced and maintenance is easier. An effective filter helps overall IAQ by removing (trapping) smaller particles such as: dust, pollen, pet hair and dander and lint. Specialized filters, such as HEPA, trap particles with 99.7

continued on 36

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Premium in-line air filters can trap many particles (no gasses) down to 0.1 microns in some cases. Such filters rely on a decent return air system and they get dirty quickly. End-users should be prepared to clean the filter elements every 60 days. Use the same schedule for HRV filters; clean HRV core every six months.

per cent efficiency down to 0.3 microns. The unit I use is 99.98 per cent efficient, trapping particles down to 0.1 microns.

But remember, temperature control and humidity control are the first principles of IAQ. If your filter selection impedes airflow, then IAQ will suffer accordingly. Rob Falke, president of the National Comfort Institute says, "The pressure drop over the filter should not exceed 20 per cent of the maximum static pressure of the fan...if you choose a

good quality variable speed fan rated at 1.2 in. of total external static pressure, your fan can afford 0.24 in. of pressure drop over the filter." The problem is PSC blowers are rated at 0.5 in. in most cases (only 0.10 in. allowed) and you must check your manufacturer's variable speed blower charts because static pressure ratings can vary widely (0.90 in. to 1.2 in. typically) depending on the model. Two other considerations:

- Many cabinet MERV 11 or better filters have a fairly high initial pressure drop. If you have got a PSC blower rated at 0.5 in. (meaning the filter should drop 0.10 in. or less) and the filter selected has an initial pressure drop of 0.26 in., that is not going to work.
- For example, when using a VS blower rated at 1.2 in., and your total system external static pressure including a 0.26 in. filter works out to 0.76 in. w.c. the VS motor is going to use more watts than expected. The operating cost will be higher, so if you told your customer the fan uses as much power as a 100 watt light bulb, you will be left with some explaining to do. Use the lowest initial pressure drop filter available, or possibly use the next largest size if the ΔP is lower.

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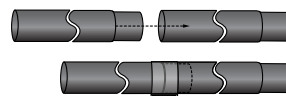
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IN THE END

I haven't even mentioned issues like asthma: the Asthma Society of Canada says more than three million Canadians have asthma which is associated with indoor allergens like dust mites, mould, ozone, volatile organic compounds, and phthalates found in some types of PVC. Then there is stuff an HRV can drag in, such as: nitrogen dioxide, sulphur dioxide, carbon monoxide, reduced sulphur compounds, ozone, and fine particulate matter or PM2.5. Nor have I talked about IEQ in commercial buildings, a place many people say makes them sick.

While the government, on one hand, may assert the right to compel private citizens into actions seemingly aimed at preserving their best interests, it is certainly another thing to legislate their behaviour at home. Governments, jolted into action by the climate change crisis, will certainly become permanent residents of the nations' mechanical rooms. Because the homespun activities of many Canadians may no longer be suitable for tight construction, how long will it be before a smart HRV sends its owner a bill for failing to maintain key components?

Considering all the potential complications associated with living in a truly artificial environment, our industry has the responsibility to specify and to install the best possible



It is time for a concentric HRV termination with a riser kit, or better yet, a faux chimney vertical termination.

equipment in order to provide an appropriate IEQ. Where the end user takes it from there, is something we will have to deal with as best we can.



Ian McTeer is an HVAC consultant with 35 years experience in the industry. He was most recently a field rep for Trane Canada DSO. McTeer is a refrigeration mechanic and Class 1 Gas technician.

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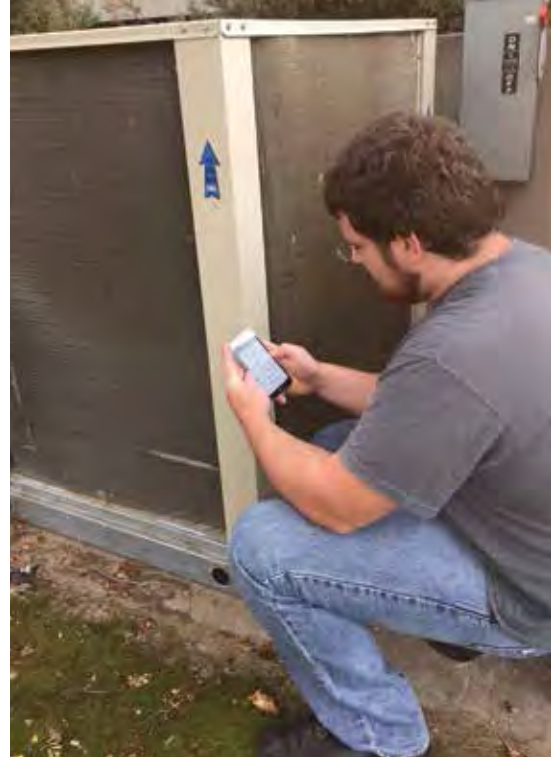
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THE PLUMBER IS NOT DAMNED!

Mr. and Mrs. Consumer Like Him, But Think He Is Missing Bets by Not Trying to Sell Them What They Need

There is no magic way to discover public opinion concerning the plumbing trade. The only way is to go out and ask questions of home-owners, and that is what SANITARY AGE has done in a cross-section of Toronto homes.

This "Survey of Public Opinion", which inaugurates a series of similar AGE *Surveys* to be published from time to time concerning various subjects, reveals many interesting facts worth the study of Master Plumbers and of all who are interested in the sale of this industry's goods and services.

Mrs. Consumer Thinks It – and Says It!

Mrs. Consumer says: "My plumber has always given me good service. . .Plumbers charge too much. . .Our plumber is a smart salesman. . .We phoned him and he never came. . .My husband does all our plumbing. . . Plumbers are all right. . .Plumbers are pirates. . .Our plumber is a real friend. . ."

That is what Mrs. Consumer tells her friends, and that is what her friends believe. These are merely personal opinions, but they are based on personal experiences with the trade, and the expression of these opinions has great bearing on the possible success or failure of the trade in any given community.

The AGE visited homes in the north, east and west of Toronto, so that a true cross-section of opinion might be obtained. A specially-prepared questionnaire was used, and the answers given by housewives have been broken down and proportions have been arrived at on the basis of 100 home-owners' reports.

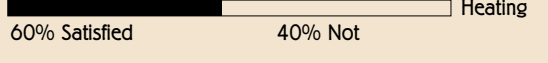
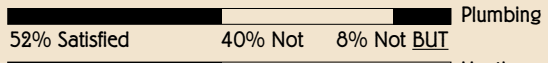
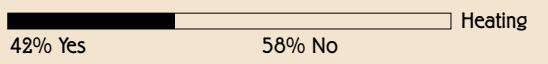
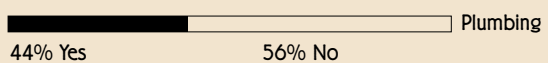
On the whole the report was favourable to the plumbers of Toronto. It showed a decided effort on their part to sell themselves and their services to the public. It also showed certain weaknesses which can be and should be remedied, in the interests of better service and better business.

• 1920s – 1930s •

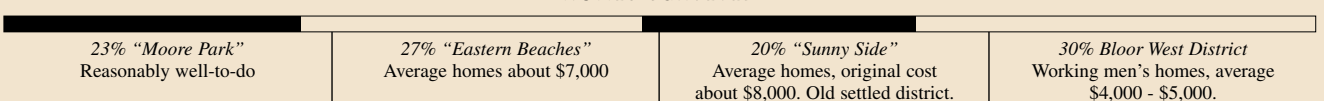
PLUMBING AND HEATING CONSUMER SURVEY

1. How many times within the last year have you called your plumber.
2. Do you have a regular plumber or do you call anyone whom you happen to think of.
3. Do you think that prices charged by plumbers are fair prices to cover time and materials used.
4. Just as general principle do you agree that the plumbers serving your community could give better service to the public if they charge fair prices which include a small and reasonable profit.
5. Has your plumber ever suggested changes to improve (A) Your plumbing, (B) Your heating.
6. Are you completely satisfied with your present (A) Plumbing, (B) Heating.
7. If your plumber showed you how to save money on your plumbing and heating or how to make it more comfortable or convenient for you would you be interested in his advice, even if you were not interested in buying at the present time.
8. Do you believe in quality at a slightly higher price to inferior workmanship and materials.
9. Do you agree with the idea that proper plumbing and heating is one of the most economical investments because it lasts a life time.

Average 2 1/4 times



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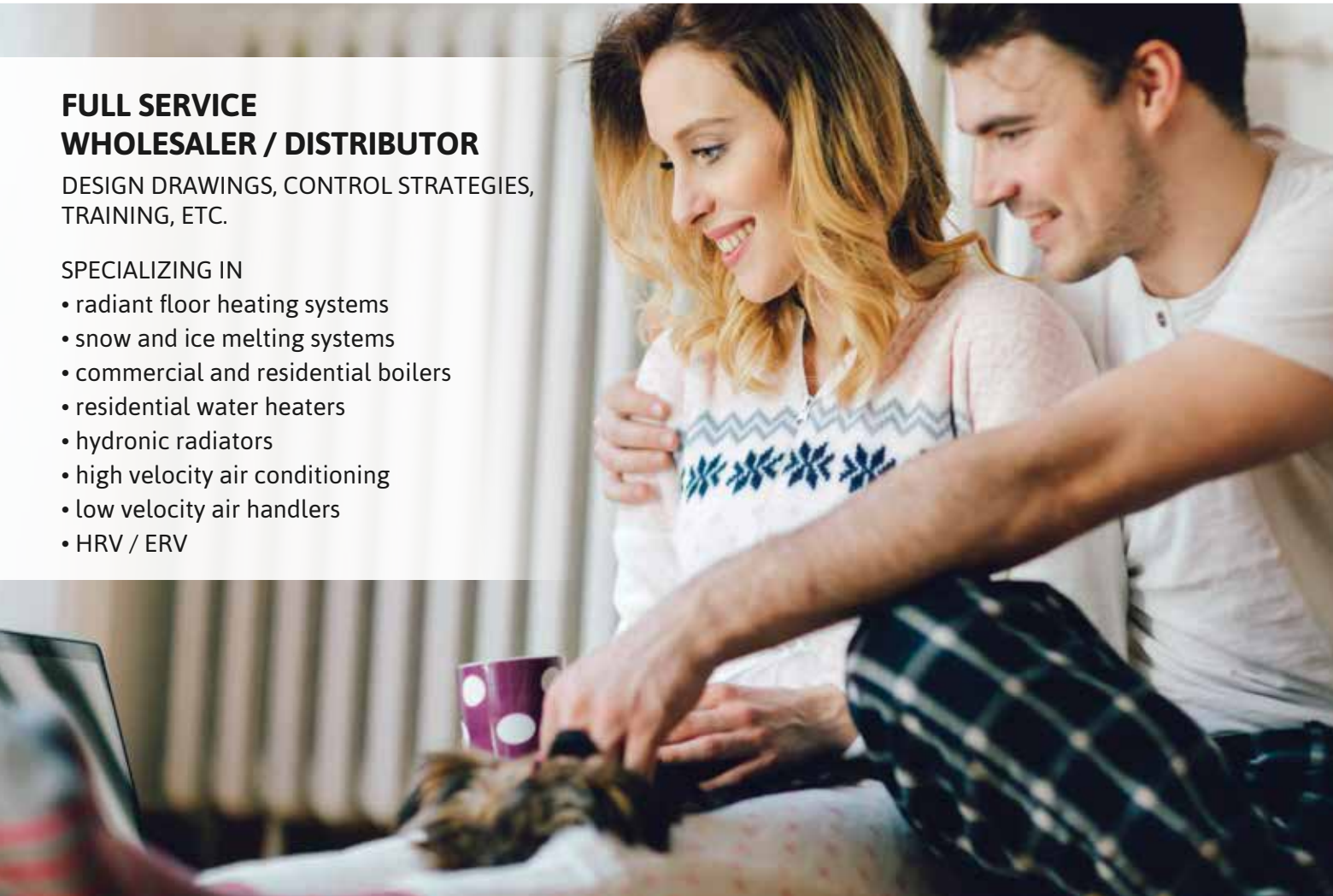
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This has two key benefits:

- The low/high outlet temperature limits are easily adjusted from above the deck, and can be set to ranges between cold water and 120°F (49°C).
- This all-in-one design minimizes installation time and reduces the number of potential leak points.

Other features include:

- Reliable, hands-free activation
- Convenient top mixer for the end user to adjust the temperature within the set limits
- The ability to set a single, fixed temperature
- 15-second run time

WATER CONTROL FEATURES

- The outlet temperature comfort stop range is adjustable from cold to a maximum of 120°F (49°C), factory set to 105°F (40.5 °C)
- The valve features two “Comfort Limit Stop” pins that can be positioned to control the hot and cold output temperature limits, or to set to a single, fixed outlet temperature.
- The valve and electronic components are fully contained within the faucet body, allowing access from above the deck
- A mixing handle allows the user to adjust the temperature
- Factory-set to dispense up to 15 seconds of water

POWER OPTIONS

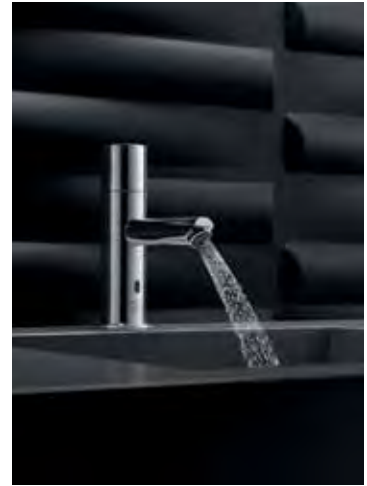
- Battery operated, battery box and 6 AA batteries included
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OTHER SMART FEATURES

- An anti-rotation pin (included) keeps the faucet aligned
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DO THE MATH, TRUST THE MATH

What is the down side of oversizing equipment?

BY STEVE GOLDIE

After over 30 years in this industry I would love to be able to state that I have seen it all and that nothing surprises me anymore. As a matter of fact “nothing surprises me anymore” is a phrase I likely repeat several times a week in the office. However, as a good friend likes to remind me, “Just because you say it, doesn’t make it so” and sadly in this case that is true.

The truth is that I am continually surprised by the creative and ingenious ways people come up with to get things wrong. My favourite example is where a contractor, upon realizing there was no convenient drain nearby, decided to get rid of the condensate from an AC unit by placing an electric hotplate under the drain. That one certainly gets the nod for creativity and hopefully it will remain a one-of-a-kind work of art. Unfortunately, many of the troublesome issues that I see are repeated far too often.

Considering that I spend a lot of my workday troubleshooting, I should be grateful for the missteps that keep me employed. I wish I could say that the majority of the issues I see are the work of unlicensed contractors or moonlighting off duty firefighters, but sadly this is not the case. The hotplate guy was a licensed contractor with many years of experience. The majority of the mistakes I see are the work of licensed tradespeople who really should know better. The truth is, most contractors probably do know better and sometimes we need gentle reminders. So let’s have a look at a few of the most commonly repeated errors in hydronics.

BIGGER IS NOT BETTER

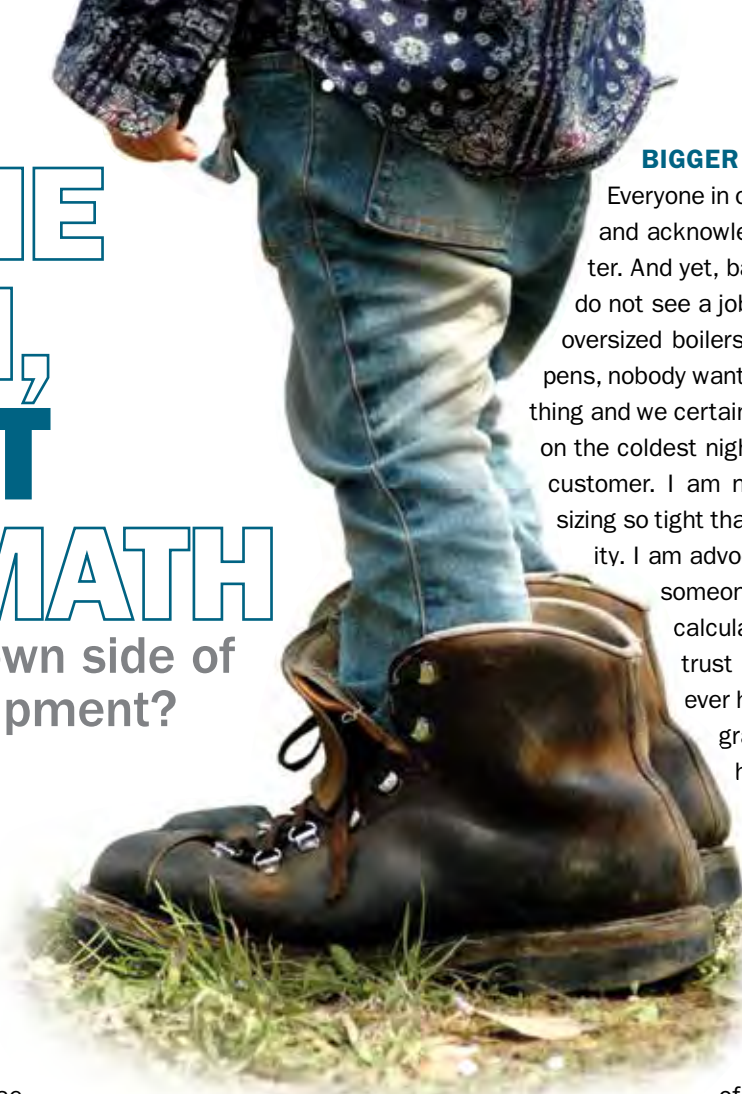
Everyone in our industry seems to agree and acknowledge that bigger is not better. And yet, barely a day goes by where I do not see a job or a design with seriously oversized boilers. I understand why it happens, nobody wants to be caught short in anything and we certainly do not want to get a call on the coldest night of the year from a frozen customer. I am not advocating cutting the sizing so tight that this is ever a real possibility. I am advocating that you do, or have someone do, a proper heat loss calculation, and having done it, trust it. Keep in mind that whatever heat loss calculation or program employed will already have a built-in buffer or margin for error so there is no need to take the final size and bump it up “just to be safe.” Do the math, trust the math and size your equipment accordingly.

What is the down side of oversizing? A boiler plant that is just too big will short cycle resulting in lower than expected ef-

iciency and premature failure of components. Modulation helps but there are still limits, especially when the boiler plant is upsized by 50 per cent or more. I regularly see boiler plants that are 100 to 200 per cent oversized and have seen oversizing by as much as 400 per cent.

In custom residential homes, sizing can be complicated by large snowmelt loads or multi-head shower systems that use as much hot water as a car wash. Still, there is no excuse for not doing the math and sizing accordingly. If the snowmelt and/or DHW load is significantly higher than the home’s heat load, then a single large boiler is not the best solution. You really need to go with a multi-boiler plant (for more on this, see Mike Miller’s article on p150) or consider separate boiler plants altogether, each sized appropriately for the application.

If a boiler is sized too big it just makes hot water faster than the heating load can take it away. This problem is often exacerbated by another problem I see far too often; undersized distribution piping. The boiler plant makes the heat, the piping is the roadway for the heat to travel to its ultimate destination, be it a radiator, a heated floor, an indirect water heater and so on.



“If the roadway is undersized piping we cannot move the heat where we want it to go fast enough...”

TRAFFIC JAM

If the roadway is not sized large enough to handle the traffic there are bottlenecks and things jam up. If the roadway is undersized piping we cannot move the heat where we want it to go fast enough, the back up results in a short cycling boiler that constantly turns on and off on its high limit. When I get a request to visit a job where there is a complaint of not enough heat, the first thing I will look at is the distribution piping rather than the size of the boiler plant. More often than not, the boiler is more than large enough but the distribution piping is inadequate, resulting in a “traffic jam” of heat trying to get to where it is supposed to be. Throw in lots of bends and a bullheaded tee or two and things really slow down.

As with properly sizing a boiler, properly sizing distribution piping comes down to the math. Do the math, trust the math and you should not have any issues. Maximum pipe flow charts are readily available so if you are not sure, check first. Size the pipe based on how many Btus a line is designed to deliver. For example, the maximum flow rate for 1.5" steel pipe is 24 gallons per minute. With a 20 degree Delta T, one gallon carries 10 000 Btus, so the maximum amount of heat you can deliver with 1.5" pipe at a 20 degree Delta T is 240 000 Btus. Do not make the mistake of sizing your pipe based on the connection size of the equipment.

Boilers, heat exchangers and indirect water tanks are three examples of equipment that often have pipe connections that are sized smaller than the maximum Btu load requires. A pinch point at a connection will create a slight pressure drop but will not necessarily reduce their actual flow rate the same way a reduction in the accumulated length of pipe will.

I have lost count of how many times I have been called on to explain why an indirect hot water tank is not producing the hot water recovery published in the manufacturer's literature. Invariably the reason is that the contractor sized the boiler supply/return piping to match the ¾" connection size on the tank. The ¾" pipe was just not big enough to supply enough flow to deliver the maximum Btus the boiler was producing. Once the piping was changed to 1" or 1.25" depending on the boiler size, the hot water production improved significantly.

RED HERRING

Bladder and diaphragm style expansion tanks are one piece of equipment where oversizing will not cause negative issues (although oversizing may seem to be the cause), other than

costing more than the appropriately-sized model. It should still be sized according to the system it is being installed on. The issue with respect to expansion tanks is that the pre-charge pressure really matters. It should always be verified and adjusted to match the job.

The pre-charge for a residential tank should typically be 12 psi, which not coincidentally matches the cold fill pressure for three storeys or less applications. The pre-charge pressure prevents system water from entering the expansion tank until the water begins expanding due to heating. If the pre-charge is too low, this initial inflow will partially, if not completely reduce the tank's volume, reducing or completely eliminating the tank's ability to accept the additional water volume when it is heated. This can make it appear that the expansion tank was undersized, where in reality the lack of pre-charge has effectively rendered it useless.

In applications for buildings higher than three storeys, the pre-charge must be adjusted to match the cold fill pressure required; the higher the building, the higher the pressure. Whatever the application, the important thing is to verify that the pre-charge pressure of the expansion tank matches the cold fill, or cold static pressure of the system. It can save you a lot of time and money, not to mention saving all those perfectly good relief valves that got changed before someone figured out they were just doing their job because the expansion tank could not do its job.

This is not an exhaustive list of the issues we see out there but it does represent a large percentage of troubleshooting calls I deal with. Our entire industry is not rife with troublesome and poor installations; there are a lot of great contractors out there doing excellent, trouble free jobs.

As a matter of fact, if you are reading this magazine you are probably one of those good ones. I bet you actually read the installation manuals of the equipment you install. Perhaps I am a bit jaded because I get all the calls when things go wrong. Nobody seems to call me when everything works perfectly well. Who knows, if we can just get the rest of the installers out there to read the manuals and trust the math, maybe I can start looking for something else to do.



Steve Goldie learned his trade from his father while working as plumber in the family business. After 21 years in the field, he joined the wholesale side of the business in 2002. He is frequently called on to troubleshoot systems and to share his expertise with contractors. He can be reached at sgoldie@nextsupply.ca.



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ProVore® Grinder Pumps

Grinder technology is advancing and Liberty Pumps is at the forefront of evolving sewage pump performance. The new ProVore® grinder from Liberty Pumps is designed for use in residential applications where an addition of a bathroom or other fixtures below sewer lines requires pumping. It features Liberty's patented V-Slice® cutter technology utilized in its popular Omnivore® series of 2 hp. grinder pumps. This proven cutter design easily shreds solids - such as feminine products, rags and other unwanted debris. The new ProVore® brings this advanced technology down to a more cost effective residential level. Powered by a 1 hp. motor, this smaller grinder is designed to operate on a standard 115 or 230 volt circuit – requiring only a 20 amp breaker. No special wiring, as is necessary with larger hp. grinder pumps, is needed.

The pump comes with a 2" vertical style discharge (common on solids-handling pumps) and a standard leg pattern matching Liberty's LE-Series. This allows for an easy retro-fit into already existing systems. Engineered with flow rates to 46 GPM – the ProVore® provides adequate scouring in 2" discharge lines with lower pumping heads commonly found in residential basement installations.

Compact factory assembled systems are available in both simplex and duplex versions. The ProVore®380 uses Liberty's very popular **PRO380** basin. This system features Liberty's QuickTree® technology for easy field service of the floats without removing the cover or disconnecting the plumbing. A quick-removal access cover and heavy-duty integrally molded gaskets are also features found on this system. In addition, Liberty has just launched the new **ProVore®680** – a compact duplex version of the 380. Standing only 24" tall, this small profile duplex system utilizes two ProVore® pumps for uninterrupted service. An advanced pump controller is included with the system to alternate pump operation and provide an alarm to the homeowner in the event of a failure.

Whether it's a traditional solids-handling pump or a newer style grinder, Liberty's broad offering of products can satisfy a variety of pump applications, and with its aggressive product development strategy, you can be assured Liberty will continue to meet the needs of today's rapidly evolving market.



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ProVore® residential grinders feature:

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- No special wiring - runs on standard 115V or 230V, 20 amp circuitry
- 2" discharge



US Patent # 7,159,806
and Patent Pending

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ProVore® 680
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Healthy CIRCULATION

IT IS TIME TO GET SERIOUS ABOUT WATER QUALITY IN EVERY HYDRONIC SYSTEM.

BY JOHN SIEGENTHALER

Water is the “life-blood” of hydronic systems. Its chemical characteristics can make the difference between a system that lasts for decades, versus one that develops expensive corrosion issues within months of commissioning.

So, just as we strive to maintain the health of our own circulatory systems, it is important to maintain the health of water and water-based solutions that circulate through the hydronic systems we create and service.

Pure water consists of only hydrogen and oxygen. It is colourless, tasteless and odorless. Unfortunately, pure water does not exist in nature. Since water is the universal solvent, water from springs, wells, and even municipal mains, contains dissolved minerals such as calcium and magnesium; sediment such as fine silica sand or organic particles; and dissolved gases such as oxygen, carbon dioxide and hydrogen sulfide. Some water sources also contain micro-organisms such as bacteria or algae. There can be wide variations in these impurities from one water source to another.

In most hydronic systems, the unknown chemical characteristics of the water used to fill the system have the opportunity to interact with several materials and other chemicals already in the system. These include: metals such as cop-

per, brass, cast iron, stainless steel, and carbon steel; liquids such as glycol-based antifreeze, and thread cutting oils; and greasy residue such as solder flux. This complex combination of chemicals and metals has the potential to create undesirable reactions such as oxidation, sludge formation, galvanic corrosion and pitting corrosion.

HOPING FOR THE BEST

Unfortunately, the chemistry that could take place in newly crafted hydronic systems is often ignored. Many systems are just filled with whatever water is available on site.

Some systems will provide years of reliable service because of a lucky set of circumstances involving the purity of the water source, the materials used in the system, the care taken when assembling the system and its subsequent operation and maintenance. Other systems will experience premature component failure due to an unlucky combination of these factors.

LOSE THE IONS

One of the best ways to minimize the potential for undesirable chemical reactions within hydronic systems is to demineralize the water. As its name implies, demineralization involves removing undesirable minerals such as the dis-

solved calcium and magnesium compounds found in most ground water and municipal water systems.

From a process standpoint, demineralization is similar to water softening. Both are called “ion exchange” processes. The undesirable ions in the source water, which come from dissolved salts containing calcium, magnesium, manganese and chlorine, are captured and exchanged for ions that do not precipitate out of water when it is heated.

In a typical water softening process, the source water is passed through a column containing tens of thousands of small polymer resin beads that are chemically structured to attract undesirable ions such as those mentioned above. When an undesirable ion bonds to a bead, another ion, specifically a sodium ion (Na+), is released from that bead. This “give and take” of ions is necessary to maintain the chemical charge balance of the water.

As the source water passes through a column filled with these resin beads, it will be largely stripped of the ions that can precipitate out of solution as the water is heated, and harden into scale. The sodium ions that replace the original ions are more soluble in heated water and won't form scale.

Softened water is certainly better than the original water from the standpoint of its ability to form scale, but it is still not pure water.

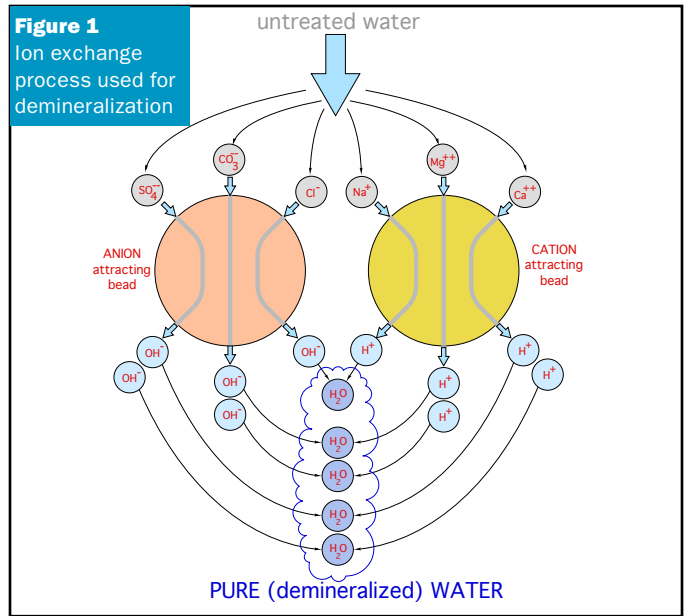
The presence of sodium ions in the softened water leaves the water with relatively high electrical conductivity. This characteristic makes the likelihood of galvanic corrosion between dissimilar materials in the system (such as copper and iron) more likely. Softening solves one problem (e.g., removing calcium and magnesium ions from the source water, which would otherwise cause scaling), but leaves the water in a condition that could lead to other problems (e.g., galvanic corrosion).

LOSE THE SODIUM

The preferred ion exchange process for water used in hydronic systems is demineralization. It also involves passing the source water through a column filled with resin beads. However, these beads are different than those used in water softeners. They are chemically structured so that when they capture an undesirable ion they release either a hydrogen “cation,” which is chemically represented as (H+), or a hydroxide “anion,” which is chemically represented as (OH-). The hydrogen cation has one positive charge, and the hydroxide anion has one negative charge.

What do you think happens when one hydrogen cation (H+) meets up with one hydroxide anion (OH-)? Hint: Look at the number of hydrogen and oxygen atoms present, and remember that positive and negative charges attract.

That is right. The cation and anion bond to form a neutral molecule of pure water (H₂O). *Figure 1* illustrates the overall ion exchange process used for demineralization.



Water that has been highly demineralized has characteristics that are ideal for water-only systems and as base water to be combined with inhibited glycol antifreeze or with additional chemical stabilizers.

A SIMPLE PROCEDURE

There are two ways to demineralize the water used in hydronic systems:

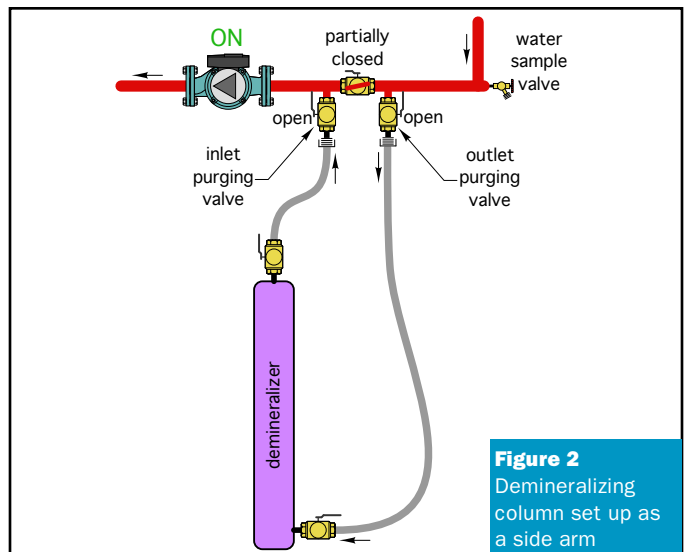
- Fill the system with demineralized water; or
- Fill the system with source water and then demineralize it.

The first approach is good for smaller systems, where the flow rate of water through the demineralizer is sufficient to purge air from the system.

The second method is better in systems where the flow rate through the demineralizing column is insufficient to purge air from the system.

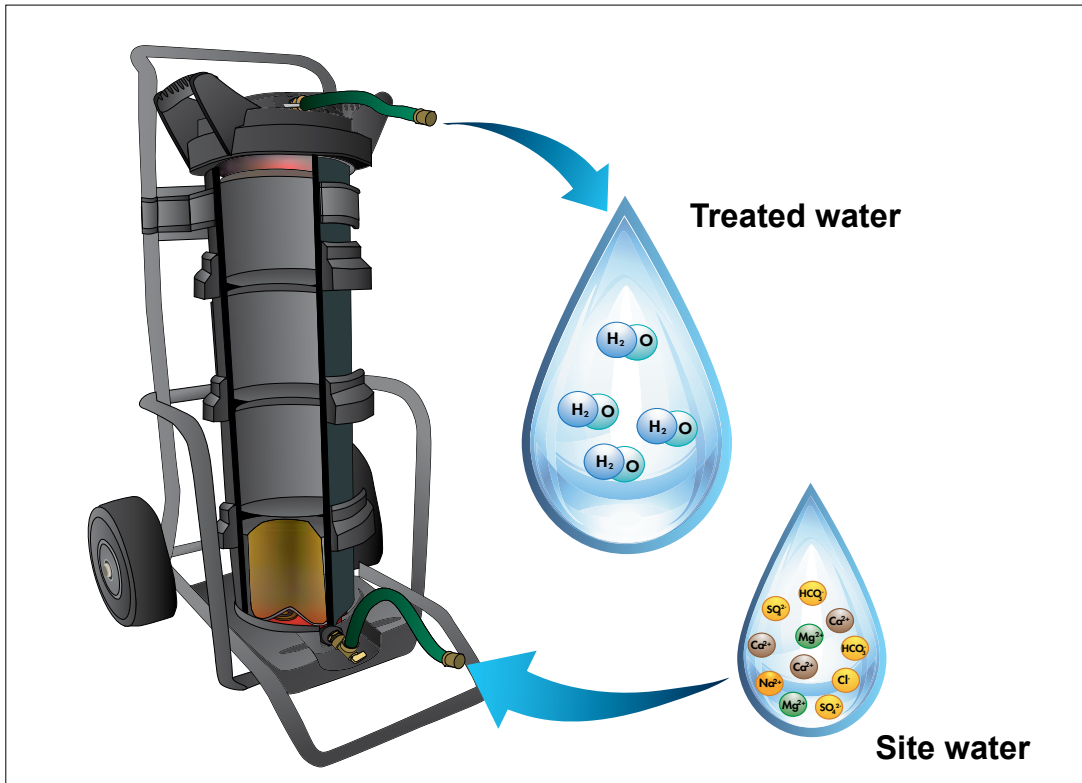
If using the second method, the demineralizing column is typically set up as a “side arm” device as shown in *Figure 2*.

continued on 54



HYDROFILL™ hydronic water treatment filling unit

HYDROFILL™ is a portable water treatment filling unit that produces from site sourced water, demineralized water of an ideal grade for use in closed hydronic heating systems. Salts and other soluble minerals are almost entirely eliminated so as to prevent premature equipment malfunction including reduced efficiency or component failure due to lime scale formation – a common affliction of heat exchangers. The treated water is also low in electrical conductivity to minimize corrosion due to galvanic attack. Lastly, by eliminating the variability of site produced water having different mineral content values from location to location, using treated water makes for more reliable dosing when chemical additives are used – such as glycol.



Site water contains soluble minerals which exist as positive or negative molecules. Mixed bed resin beads are charged with positive hydrogen (H⁺) and negative hydroxide (OH⁻) molecules. As water flows up through the column of mixed bed resin beads, the soluble minerals are “exchanged” with either hydrogen or hydroxide, the two then combine to form H₂O (e.g., pure water). In effect, the soluble minerals are “pulled” from the site water and are replaced with pure water.

HYDROFILL™ is a convenient tool for installers to use water available at a job-site to produce ideal grade demineralized water at an economical cost per gallon.



Read more about water quality in hydronic systems in *idronics™* 18 design journal. Download or request your free copy at www.caleffi.com.

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Hydronic water treatment filling units

Water is the “life-blood” of hydronic systems. Just as we strive to maintain the health of our own circulatory systems, it’s important to maintain the “health” of water and water based solutions that circulate through the hydronic systems we construct and maintain.

HYDROFILL™ portable water treatment filling units remove “hard water” scale producing minerals, such as calcium and magnesium from job-site water. Salts and other soluble minerals are eliminated to prevent premature equipment malfunction including reduced efficiency or component failure due to scale formation.

HYDROFILL™ is a convenient tool for installers to use job-site water to produce ideal grade demineralized water at an economical cost per gallon.



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The system piping is equipped with either a combination purging valve, or three ball valves as shown in *Figure 2*.

One hose brings water from the system to the demineralizer, the other returns the processed water back to the system. The inline ball valve between the inlet and outlet valves is partially closed to create a pressure differential that drives some flow through the demineralizing column. The system's circulator must be on to create this flow.

After the water has passed through the demineralizer for a few minutes, draw a sample of water from a drain valve and test it for a total dissolved solids (TDS) value. The TDS reading can be found using a low cost TDS meter such as the one shown in *Figure 3*.



Figure 3
Low cost
TDS meter
Courtesy of Caleffi
North America

TDS is an inferred value based on the water's electrical conductivity. Ground water can have TDS values between 50 and 500 PPM. Sea water can have a TDS value as high as 40 000 PPM.

The water should be demineralized until it has a TDS value between 10 to 30 parts per million (PPM). This is low enough to minimize any potential for scaling or galvanic corrosion, but still high enough to allow low water cutoff devices (which rely on electrical conductivity) to operate. Once the TDS value of the water is reduced to this range, the demineralization process is complete. Close the valves, remove the hoses and drain the remaining water from the demineralization column.

THE FULL COURSE

Although demineralization is the primary method for improving water quality in hydronic systems, I also recommend that you precede it with a thorough internal washing of the system, and follow it by adding a stabilizing chemical formulation.

Internal washing is done by filling the system with water, adding a "hydronic detergent" formulation (now available from several suppliers) and circulating this blend through the entire system with the heat source operating at normal temperature, for at least one hour. The hydronic detergent breaks down oils and greases within the system, and suspends them in the circulating fluid. At the end of the wash cycle this fluid is completely drained from the system and disposed of based on the detergent supplier's directions. Most of the currently available detergents are biodegradable and easy to dispose.

After the water has been demineralized, I also recommend adding a film-forming hydronic system stabilizing formulation. Again, several such products are available in North America. They form extremely thin protective films on the inside of the piping components. They also contain chemicals to stabilize the pH of the fluid, and help protect the system against the slow but unavoidable oxygen diffusion that occurs over the system's life.

The icing on the demineralized water cake is to include high performance air and dirt separation within the system. These functions can be achieved with separate devices, or a single device. If the system contains any ferrous metals such as cast-iron or steel – as most systems do – the dirt separating device should include a magnet to capture ferrous oxide particles. I also recommend dirt separation for systems containing high efficiency circulators with permanent magnet motors.

The health of the water in hydronic systems is important and has been largely overlooked by the North American hydronics industry for years. It is time to correct for previous complacency and get serious about water quality in every hydronic system. The above procedures will guide you, and the results will reward you with good performance and long service life.



John Siegenthaler, P.E., is a mechanical engineering graduate of Rensselaer Polytechnic Institute and a licensed professional engineer. He has over 34 years experience in designing modern hydronic heating systems. Siegenthaler's latest book, Heating with Renewable Energy, was released last month.



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Vitocrossal 300, CU3A - The perfect “drop-in” solution for high-mass, high-temperature applications

Viessmann has a long history of consistently offering one of the most complete and flexible ranges of heating solutions on the market.

Continuing in this tradition, the **Vitocrossal 300, CU3A** gas-fired floor-standing condensing boiler combines proven condensing technology with quality Viessmann craftsmanship.

With its high water content, the **Vitocrossal 300, CU3A** is the perfect choice for homes with high mass cast iron radiators or multi-zone high temperature fin tube radiators, as well as new installations with high DHW requirements.

A time-tested and trusted condensing boiler with over 20 years of performance credentials in European heating markets, the CU3A offers the following benefits to the heating contractor:

Ease of Installation

- The floor standing design and small footprint of the CU3A allows for trouble-free positioning within the boiler room and eliminates the need for concrete platforms, cement blocks, or the construction of a wall on which to mount the unit.
- High mass design and low pressure drop eliminate having to purchase and install special piping, dedicated boiler pumps, low loss headers, etc.
- The **Vitocrossal 300, CU3A** can simply be connected to the existing system piping, making it the perfect “drop-in” solution for boiler replacement projects.

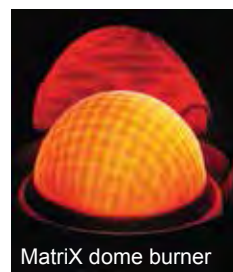
Straight-Forward Commissioning

- The CU3A features boiler and system controls that are factory pre-set to handle virtually any application.

Hassle-Free Serviceability and Easy Access

- The smooth stainless steel heat exchanger surfaces allow condensate to simply run downwards, creating a permanent self-cleaning effect. This ensures continual high-efficiency operation, long service life, and reduced maintenance requirements.
- Inspection of the combustion chamber and burner components is easy. Simply remove the boiler’s front cover, break the gas union, remove a few bolts and disconnect plug-and-play electrical connections and you’re done. Just pull out the burner and rest it on the support hooks provided for that purpose. Any dust or debris that may have collected within the combustion chamber and heat exchanger can simply be flushed away using a simple garden hose.

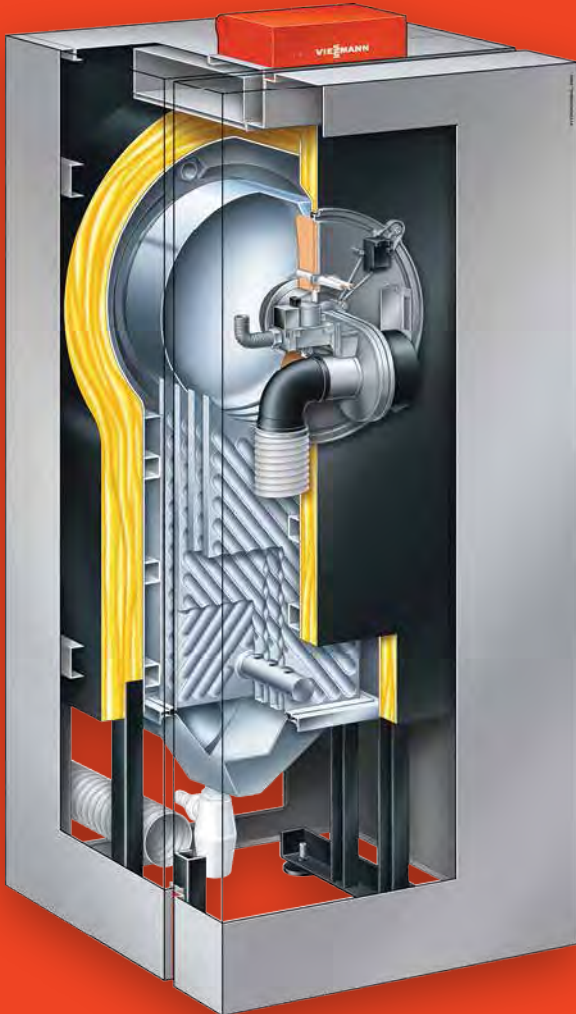
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GREASE LIGHTNING: HAVE PRIDE IN THAT RIDE

Are you up to speed on grease management?

BY ANDREW BIRD



Sized, specified, installed and maintained correctly, a grease interceptor is the foodservice operator's best protection against potentially significant fines and penalties.

The grease management industry has developed significantly in the past decade with not only more advanced and improved products, but also development of performance standards, such as CSA B481-2012, and the harmonization of common terms and references, both in Canada and the US.

Like most industries these days, grease management while conceptually simple, is full of terms, references and acronyms. Would you know an HGI from a GRD or a GGI? What is the difference between gpm and gallons? How is the right size and format of product selected for a particular application?

At its core and still prevalent, the term “grease trap” is commonly heard, even though this is progressively disappearing from technical and reference language. This change is slow, particularly within the contracting and supply chain. But based on an industry-wide recognition that the term “trap” suggests the presence of a water seal as part of the interceptor, like a p-trap under a sink, the purpose is to retain an amount of liquid to stop gases and unpleasant odours from entering the occupied areas of a building through the drains.

Based on bad operational experiences and challenges, the function of grease interceptors was recognized to be more seriously impacted by air pressure changes and balancing in the drainage system. If installation or system issues created a negative pressure in the interceptor the risk was significant that fats, oils and grease (FOG) once captured could later be literally sucked into the downstream system. Given that the “trap” was intended to prevent fats, oil and grease from entering the municipal drainage and sewer system, this was clearly an issue.

Today, modern interceptors are generically designed and required by North American plumbing codes to be externally vented and trapped, in conjunction with external water seal traps as a standard part of the system. What does this mean for a food service operator? Use a professional, licensed plumber for installation and understand the product that is being installed, signing off only when you are satisfied and most importantly understanding and implementing the maintenance requirements for that product.

Generically, the term “grease interceptor” regardless of

type is defined as a plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept non-petroleum FOG from a wastewater discharge.

Grease interceptors can be categorized into three generic types: hydromechanical (HGI), gravity (GGI) and grease removal devices (GRDs).

Hydromechanical Grease Interceptor (HGI)

An HGI is sized by flow rate, measured in gallons per minute (gpm). The major product brands have independently verified separation/retention efficiency, certified against national performance standards (CSA B481-2012 in Canada) by third party organizations such as CSA, NSF or ETL. An HGI incorporates a defined means of flow control – internal or external, managing flow rate and characteristics of the influent, also entraining air. The HGI will include interior baffling and/or details in combination or separately, actively forcing the hydromechanical separation of FOG.

Gravity Grease Interceptor (GGI)

A GGI is characterized by physical volume (gallons) and assumes a minimum 30-minute retention time for the influent, before being discharged downstream. There will be not less than two compartments and a total volume of not less than 300 gallons (1135 L). The average GGI is 1000 to 1500 gallons capacity. A GGI receives uncontrolled flow from connected appliances, using the sole principle of gravity separation (flotation due to relative buoyancy) to separate FOG from wastewater discharges. GGIs are typically installed outside the building they serve (below grade), due to their physical size and nature of the maintenance required.

Grease removal Device (GRD)

A GRD is at heart a hydromechanical grease interceptor that removes non-petroleum FOG from the separation chamber by a mechanical method(s), to a separate holding container. This process is automatically or manually initiated and involves maintaining the FOG in a liquefied state by heating, to allow transfer to the storage container. GRDs are installed inside the facility they serve and are best suited to serve single appliances on a dedicated basis. GRDs require electric supply and for some, other service connections such as hot water supply.

Now that you know your interceptors (see sidebar, p62), how do you determine which is the best choice for the installation or application? The good news is that a CSA committee, which was responsible for developing and writing the CSA B481-Series of Standards for Grease Interceptors, has done most of that work.



HGIs are generally installed inside the facility they serve, however the market is recognizing the application of Extended Capacity HGI products (up to 100 gpm) that will more commonly be installed outside the building.

By comparison, the HGI as a generic type of interceptor, is very much an engineered solution specifically designed for the purpose of effectively and efficiently separating FOG from wastewater. Like most products this is a good, better, best situation with products that have not changed for many years to others that continue to actively grow, develop and improve upon the solutions offered to customers.

The National Plumbing Code of Canada (NPC) as of 2012 began to reference the then recently published and updated CSA B481-2012 Standard, the scope of which is for grease interceptors up to a 100 gpm flow rate. Not only does this standard reference the separation performance of the interceptor offering two methods of performance evaluation (481.1 – test methods and rating using lard; and 481.2 – test method and rating using oil), it additionally qualifies minimum requirements for materials of construction, cover load ratings, crush resistance, leak testing and so on (481.0). Parts 3, 4 and 5 in turn address sizing, location and installation; maintenance; and, performance of interceptors fitted with removal devices (GRDs), respectively.

Having been published into NPC, one by one the provincial plumbing codes have in turn also adopted the same reference, giving an almost consistent basis and model of application across Canada. Of course there are always a couple of exceptions, for example Metro Vancouver adopted its own sizing methodology due to historic and perceived local constraints. Ontario has a different view and requirements regarding the location of flow control devices. Exceptions aside, CSA B481 has provided this sector of industry with a consistent model document on which to base local ordinance. In turn, cities are now adopting and referencing that Standard at their own levels.

The City of Toronto has conducted an extended period of review and public consultation beginning in 2014. Having

continued on 62



CB Supplies has moved its factory to a new home

CB Supplies has manufactured over 1 billion feet of pipe – and we're just getting started. In November 2015, we moved into a new, custom-built 126,500 sq. ft. state-of-the-art manufacturing facility in Surrey, British Columbia. With manufacturing, distribution and the head office now under one roof, as well as the potential to triple our manufacturing capacity, CB Supplies is ready to grow.

And we're proud to announce the launch of a brand new piping product into the North American market:

Introducing VIPERT Potable & Radiant PERT Tubing

We have been developing VIPERT Potable & Radiant tubing in partnership with The Dow Chemical Company for six years. Dow makes the resins that are the key raw material for CB Supplies to extrude into VIPERT tubing.

VIPERT Potable and VIPERT Radiant are designed to perform as well or better than any other flexible plastic tubing. Increased flexibility makes installation a breeze. In extreme cold outdoor temperatures, the pipe maintains its flexibility better than PEX. VIPERT also offers superior hydrostatic strength at high temperatures and burst pressures that far surpass required industry standards.

But striking performance isn't all you get. VIPERT is recyclable, so you don't have to throw your scraps in the garbage. It requires less energy to be produced, creating a smaller environmental footprint. Plus, CB Supplies stands behind it with the same comprehensive 25-year warranty that our customers have come to trust on our PEX pipe.

From applications and specs to certifications, you'll find everything you need to know about VIPERT Potable & Radiant PERT Tubing at www.VIPERT.com.



About CB Supplies

Established in 1962, CB Supplies Ltd. is a Canadian-based manufacturer and has been making PEX pipe since 1999. It also distributes a wide selection of products primarily used in residential and commercial plumbing, as well as radiant heating systems and HVACR products. CB Supplies is Canadian-owned and operated by the Lowe family.

"Since purchasing CB Supplies in 2012, we have reinvested heavily in the business. Between new equipment, IT systems and a custom manufacturing plant, CB Supplies is ready to realize its potential."

– Warren Lowe, VP Corporate Development





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VIPERT is recyclable and requires less energy to be produced than PEX



25-YEAR WARRANTY

CB Supplies stands behind VIPERT with a 25-year warranty



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Eliminate hot and cold water cross connections

Potable: ●●● Radiant: ●



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Established in 1962 CB Supplies is a Canadian-owned and operated manufacturer and distributor of products primarily used in residential and commercial plumbing and radiant heating systems. CB Supplies has been manufacturing PEX pipe since 1999 and sells throughout Canada and the United States.

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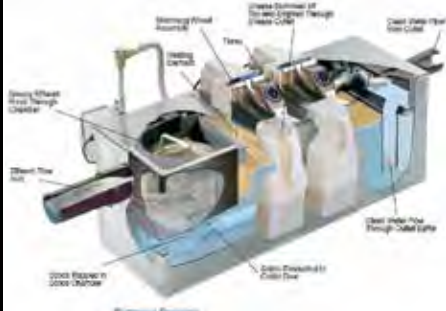
Manufactured by:



With:



Grease Interceptor:
A plumbing appurtenance or appliance that is installed in a sanitary drainage system to intercept non-petroleum fats, oil, and grease (FOG) from a wastewater discharge.



KNOW YOUR INTERCEPTORS

Hydromechanical Grease Interceptor (HGI)

- **Managed flow rate**
- **Design elements/features to force FOG separation**
- **National Performance Standards (CSA B481)**
- **Compact, high efficiency performance**
- **Commonly found inside the building, on or recessed into the floor**

Gravity Grease Interceptor (GGI)

- **Uncontrolled flow of influent**
- **Rely on gravity and time (min 30 mins) to separate FOG from water**
- **No applicable performance standards**
- **Traditionally concrete or fiberglass construction**
- **Typically outside the building due to size and nature of maintenance**

Grease Removal Device (GRD)

- **Based on functional principles of HGI**
- **Located inside the building**
- **Need electrical and for some, other service connections e.g. hot water**
- **FOG skimmed periodically to a separate container**
- **Best suited to serving a single, high FOG producing appliance**

a five-seat saloon car that has not been serviced or maintained for the last 50 000 kilometers and realistically expect to make it to your destination. Similarly, trying to save a few dollars on the cost of your grease interceptor is a completely false economy.

Without the proper maintenance and product characteristics best suited to the application, chances are that the interceptor will be a constant source of irritation and downright loathing. Call-backs, blockages, foul odours, leaks and progressive loss of performance due to corrosion are all common complaints.

Correct sizing of the interceptor is key and any product manufacturer worth your patronage as a product installer will assist in sizing and review your application to identify the right product for the job at hand. Many manufacturers have simple online calculation tools or apps that can guide you in making the correct determination of the size required. Once installed, take a couple of pictures and send them to the manufacturer to verify that the installation has been made correctly. When handing over to the owner or manager of a foodservice location, be sure to hand on any instruction or product information for their reference.

When all is said and done, a foodservice operator should consider a grease interceptor to be their best friend, not their worst enemy. Yes, there is some cost involved. Yes, regular maintenance is a necessary evil, but back to the car analogy. You can drive a vehicle that you do not service, that is consequently in poor mechanical and operational repair, and leaks on your garage floor; belches foul-smelling blue smoke and that you know is going to get you pulled over or let you down at the most inconvenient time possible—either way you are paying an unexpected bill. Or, you can replace that vehicle with something newer, maybe even new off of the lot. Financially it hurts for a week or so, but you now have some peace of mind and pride in your ride.

Sized, specified, installed and maintained correctly, find a product that you as an installer can be confident in and, like the car, encourage pride in every GI installed. Love them or hate them with a passion, there is a GI for every application. HGIs, GGIs or GRDs all have their place. That interceptor is a foodservice operator's best opportunity to avoid potentially significant fines and penalties, not to mention the cost of clean-up, environmental impact and other consequences were an overflow to occur.

Andrew Bird is business development manager for the Endura Separation Technologies Group at Canplas Industries Ltd., in Barrie, ON. Canplas Industries Ltd. is an Aliaxis Group company, a manufacturer of plastic solutions for fluid transport in the field of construction materials. www.canplas.com

¹ Influent – Wastewater containing non-petroleum fats, oils and/or grease

concluded that process and submitted recommendations to City Council in late 2015 and again with amendments in February 2016, they have now approved updates regarding grease interceptor requirements for all commercial foodservice establishments as part of a wider review of the City of Toronto Sewers By-Law. These updates reference CSA B481 and are being implemented immediately. This will result in a proactive compliance review period, requiring new and existing installations be brought in line with the new by-law requirements. Toronto is being watched closely by a number of other major Canadian cities and is expected to be a benchmark for them in making similar implementations.

Part of the compliance program for the City of Toronto will be reviewing the size of grease interceptor in use to ensure that it is adequately sized for its application and that it meets the CSA performance requirements. Sizing of an interceptor is often seen as a challenge but is key to the successful operation in its intended application.

A foodservice operator has to consider their grease interceptor like their car. You cannot viably fit a family of six in

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The Internet of What?

The Internet of Things (IoT) is a technological wave that aims to further connect people to innumerable devices. Phrases such as sending ‘big data’ up into ‘the cloud’ are not uncommon when discussing the IoT. The idea of a thoughtful building, or one that takes a holistic approach towards functioning are adjectives that are tossed around like they are common sense – but it is these expressions that help to make the IoT an intimidating topic.

A contractor recently suggested that steering into the curve of the Internet of Things would be like digging his own occupational grave. His reasoning was that once set-up, an IoT system can diagnose problems within their own mechanics, communicate them, and oftentimes fix the issue without the need of a contractor. Therefore, by installing these systems in homes and buildings, contractors will have a surge of work, but it will then fizzle out as the machines begin to do the HVAC contractor’s job. As expected, this particular contractor was hesitant to jump on the IoT bandwagon.

His concern was posed to Jonathan Holloway, strategic marketing director with Danfoss North America, who replied, “I expect the scope rather than the scale to change, including a focus more on diagnostics and electronics.” Holloway further explained that specialized skills will be in high demand and noted that, “highly skilled contractors equipped to use tech-

Beyond the jargon; there is an opportunity for mechanical professionals who embrace IoT.

BY BETH MCKAY

nology to complete work faster and provide additional value to their customers will command higher service fees.”

Just like so many other jobs in the 21st century, the medium of HVAC work is changing, and keeping up with this shift will mean staying on top of interconnected technology.

The rate at which the IoT technology is multiplying is expected to increase. In fact, by 2020, Gartner Inc., an information technology research and advisory company, projects there to be over 26 billion connected devices. Navigant Research, a market research and consulting team, expects revenue from home energy management systems to grow from \$512 million in 2013 to \$2.8 billion by the same year.

“Every 10 to 15 years we get waves – the internet was one, then cell phones were another. The IoT is one of these waves,” said Paul Barter, adjunct professor of Techno Strategy, Schulich School of Business.

So what exactly is the IoT? At the World Energy Engineering Conference (WEEC) in Orlando, FL. in October 2015, Neil Maldeis, energy solutions engineering leader, Trane, said that an IoT building uses technology to gather, analyze, prioritize and make data available to building owners, operators and maintenance personnel. It does this by using sensors, algorithms and automation technologies to automatically maintain building conditions within pre-



scribed parameters, such as temperature, humidity and indoor air quality. From here, the system can collect a wide range of data, which can be analyzed and used to improve overall building performance.

While this big data (information) is being sent up into the cloud (a holding tank) for analysis, IoT building occupants can expect a seamless work experience. Ryan Sen, director of sales support, Distech Controls, described the typical work day for IoT building occupants at the Connecting for the Internet of Things Building conference, which *HPAC* covered in greater detail in the October 2015 issue, p76.

Sen said, “buildings will be able to detect an occupant’s presence through their smart phone.” He explained that upon entering the building, the occupant’s office will be set to the temperature he likes and the window blinds may fully or partially lower to reduce the morning sun – efficiently and naturally cooling the room and reducing building energy expenses. When the occupant attends an office meeting, the room will be programmed to ensure that there is enough fresh air for the number of people within the meeting room.

These described actions are not just intelligent, and Gene LaNois, head of professional channel, Nest Labs, goes so far to say that buildings are actually transitioning into thoughtful structures. LaNois defines the thoughtful building as a building that cares about the occupant, “they can think in advance as to what you will want and need at certain times.” According to LaNois, we are in the infancy stage of the thoughtful home, but are working towards devices that can talk to and work with each other instead of relying upon human instruction.

This is where the term holistic comes into play. Just as holistic medicine treats the whole human body, IoT is looking at the “whole building and the way it is performing as a group of integrated/interdependent systems rather than a bunch of independent pieces,” said Maldeis.

In his WEEC presentation Maldeis noted that, “The HVAC industry is among the early adopters of what has come to be known as the Internet of Things.”

Over the last decade, technology advancements and the availability of HVAC system data has enabled HVAC manufacturers and service providers to create new levels of value for their customers. Furthermore, in a recent interview with *HPAC*, he said that, “Accepting and understanding IoT products is critical. As there continues to be a shift in the demographics of facility managers and building owners, the expectation to have building information readily available on a wide variety of devices will continue to increase.”

And who is to blame, err, thank, for this high expectation?

“Young people,” said Ahmed Hirani, executive vice president, sales and energy services, Distech Controls, “They want data now, and when they come into the workforce, that’s what they expect.”

Hirani explained that millennials are programmed to want unlimited access to information at their fingertips and they also understand the need for a more energy efficient work environment. According to a Pew Research Center analysis of U.S. Census Bureau data, millennials are now the largest generation in the American workforce, and whether they know it yet or not, they will want IoT building systems. However, there is a slight contradiction.

“It is estimated that approximately 50 per cent of contractors in the field today will retire over the next 10 years, creating a significant gap in the available workforce,” said Holloway. This means that as IoT systems continue to be on the incline, those that can service them are on the decline – this generation is not filling the shoes of the retiring HVAC contractors.

As a contractor, how do you equip yourself for these technical and social changes to the industry? “Train, train, train. The biggest challenge for contractors today is ensuring their technicians are trained and skilled to install and maintain the sophisticated building systems that are emerging,” said Holloway. He added, “engaging with industry to help attract new talent also is crucial to preparing for this shift.”

Similarly, Maldeis suggests that talking to manufacturers and service providers who are designing the IoT products will help prepare and familiarize contractors with IoT.

“Another way to access information on IoT is through associations such as the Association of Energy Engineers (AEE) and ASHRAE who publish articles on the topic,” he said. Alternatively, there is the Information Technology Association of Canada (ITAC), that compiles and posts white papers that have been written for the government, however the ITAC also posts other people’s white papers and reports for review.

The world is not going to go to sleep one night and wake up to a city packed full of IoT buildings – “this is a long-term objective,” said Maldeis.

Technology is constantly changing and improving, and Maldeis believes that a well-executed plan over a period of time may be the best approach to implementing the IoT. Installing a few items at a time, such as a wireless building automation system (BAS) is one way to give equipment the ability to connect to the internet, and then grow the technology from there.

With the workforce base of the HVAC industry thinning out, learning and sharing IoT skills now will positively impact the HVAC industry in the near future.

WANT TO LEARN MORE? See Mark Evans' article "Home Intimation" in *HPAC* March 2012, p112; and Curtis Bennett's "Hello Boiler, it's Wi-fi Calling" in *HPAC's* August 2015 issue, mh38. Columnist Ian McTeer also offered some helpful suggestions to contractors in *HPAC's* May 2014 issue, p48. See *HPAC's* archives at www.hpacmag.com.



Fujitsu Features High-SEER Wall Mounted Mini Splits with Low Temp Heating Down to -15°F

Fujitsu's ductless split systems offer efficiency ratings up to 33 SEER, operating with optimal efficiency at ambient temperatures of -15°F. The 9,000 (9RLS3H), 12,000 (12RLS3H) and 15,000 BTU (15RLS3H) inverter systems are available with these capabilities right off the shelf with no modifications needed for low ambient operation.



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- **Base Heater**

When temperatures reach 36°F, a built-in heater warms the base of the outdoor unit so that condensation doesn't freeze. Without a heater, freezing condensate can cause noise, damage to the fan blade, condenser, and system performance.

- **Base Drainage Holes**

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All RLS3H inverter wall-mount systems are available as split system heat pumps and offer super-quiet operation and nearly full heating capacity down to -15°F ambient and cooling operation down to 14°F. Refrigerant pipe lengths can reach 66 feet between the evaporator coil and the condensing unit.

Standard features include wireless remote control, ion deodorizing filters, sleep timer, 24-hour timer, dry mode, 4-way auto louver and auto mode. Fujitsu's ESP (energy saving program) is standard on these new Halcyon systems, and conserves energy even when users aren't paying attention. Motion sensors note when the room has been vacated. After 20 minutes, the set temperature is increased by 4°F when in cooling mode, and reduced by 8°F when heating. When the room is reoccupied, the ESP returns to the previous operating mode.



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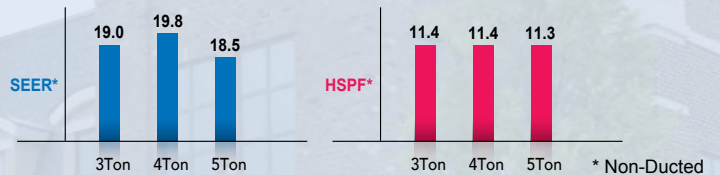
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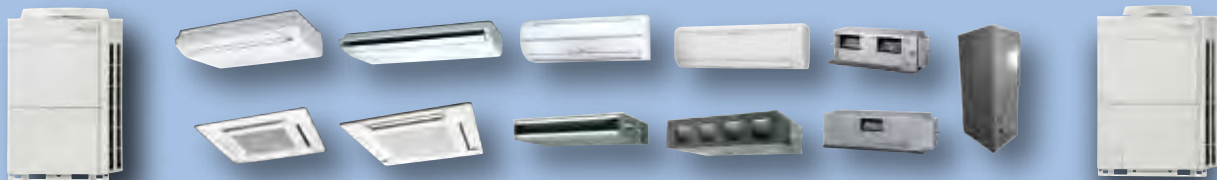
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In 2016, hilmor launched the hilmor Orbital Flare Kit which includes a large diameter tubing cutter for easy kink-free cuts, a deburring tool to smooth everything out, and of course the Orbital Flare. It's time to RETOOL + CONQUER with hilmor.



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CO₂ gets a second life

Whatever the refrigerant, we are still applying the same basic principles.

BY DAVE DEMMA

Certainly there has been a move towards considering and using CO₂ as a refrigerant in supermarket systems in the last several years. It has seen a tremendous increase in use in Europe, and to a lesser degree it has also seen an increase in Canada and the U.S. I admit that I have not been too enamoured of CO₂, until recently when I was motivated to do some in depth research on the subject for a contractor presentation.

Given the fact that global warming, I mean climate change, is not a topic that will leave the public eye any time soon, it is timely to discuss the merits of CO₂ as a refrigerant and how it differs from the refrigerants we are used to using.

As a preface to the CO₂ discussion, let's review how we got to the point that a refrigerant, which fell out of favour in the 1960s, has been given a second life.

CO₂ first became popular as a refrigerant in the mid to late 19th century. One of the marketed benefits of CO₂, as compared to other contemporary refrigerants (sulfur dioxide (SO₂) or ammonia (NH₃)), was that it was non-flammable and non-toxic. In addition to widespread use in the shipping industry, CO₂ saw use in some commercial applications as well. It reached its heyday in the 1930s. The 1950s saw the introduction of CFCs (R-12, R-22 and R-502) into the marketplace, which was a dagger to the heart of CO₂. The 1960s saw the end of CO₂ as a viable refrigerant option.

Of course, as great as CFCs were from a practical standpoint they had a high ODP (Ozone Depletion Potential). Scientists realized that CFCs were contributing to the depletion of the ozone layer, which resulted in the Montreal Protocol. It went into effect in 1987, and established phase-out dates for CFCs, with the lower ODP HCFCs to be phased out at a later date. CFCs were initially replaced with HCFCs (R-22) and later HFCs.

Interestingly enough, while HCFCs were less threatening to the ozone layer, in the 1990s these low ODP refrigerants were targeted as being contributors to global warming—aka high GWP (global warming potential) refrigerants. The Kyoto Protocol was created in 1997 and it set reduction targets for greenhouse gases, which included HFCs. CFCs and HCFCs were not included in the Kyoto Protocol, as they were already covered in the Montreal Protocol.

continued on 72

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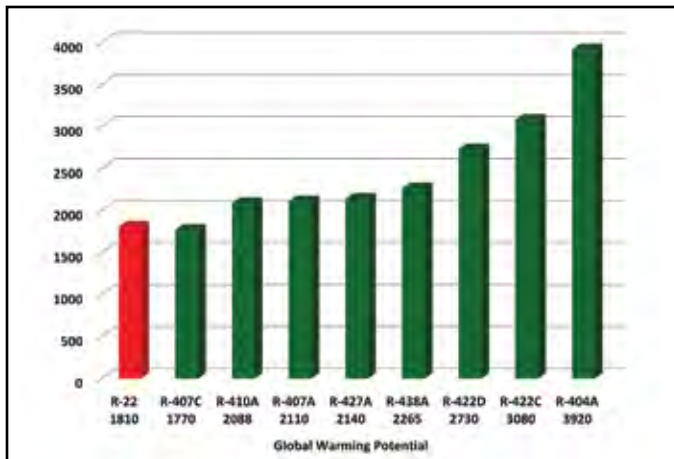
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“Under certain conditions it can be efficient, it is very safe, it is quite inexpensive and it is readily available.”

Figure 1 Comparative GWPs of common refrigerants



Both of these protocols allow all participating countries to control their respective reductions of refrigerants to meet their compliance obligations. In the U.S., the EPA has issued regulations under the Clean Air Act to phase out the production and importation of CFCs and HCFCs.

Which brings us full circle, back to CO₂ as it has a rather benign GWP of one. In actuality, GWP is a relative measure of the amount of heat a greenhouse gas traps in the atmosphere. The GWP number is a comparison between the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide. So, R-22's GWP of 1810 means that a given mass of R-22 has 1810 times the effect on global warming than an equal mass of CO₂ does. For comparison, see Figure 1 for GWP values of common refrigerants in use today.

Looking at CO₂ through the lens of these drivers reveals it to be quite favourable: GWP = 1, ODP = 0. Under certain conditions it can be efficient, it is very safe, it is quite inexpensive and it is readily available. In addition, some of the

THE MAIN DRIVERS USED TO DETERMINE WHICH REFRIGERANT MIGHT BE THE BEST CHOICE ARE:

- Environmental properties (GWP and ODP)
- Energy efficiency
- Safety (flammability and toxicity)
- Cost
- Availability

challenges that led to CO₂'s demise in the 1960s have been overcome with advances in technology.

There is no question that a CO₂ system is going to be different than the typical refrigeration system that most supermarket technicians are familiar with. Let's take a look at the similarities and the differences between a CO₂ system and the typical HCFC/HFC system.

SIMILARITIES:

- 1 Refrigeration is the achievement of a temperature below that of the immediate surroundings. Regardless of the type of refrigerant in use, we are still attempting to lower the temperature of the immediate surroundings.
- 2 Refrigeration is not cooling, but rather transferring heat from the refrigerated space to the refrigerating medium (the refrigerant). The result is a lower temperature in the space. It is still a simple heat transfer process.
- 3 Regardless of the refrigerant, we are using a fluid that has a saturation temperature (boiling point) that is somewhere between 5F to 20F lower than the space temperature. Whatever the refrigerant, if we are attempting to keep frozen vegetables at -10F, the refrigerant saturation temperature in the evaporator will likely be approximately -20F.

There are some very obvious differences between CO₂ and HCFCs/HFCs. But, let's not get too caught up in those differences. After all, we are still refrigerating. We are still using a saturated liquid as the medium that we are transferring heat too. We are still applying the same basic principles that are the basis for every vapour-compression cycle used to refrigerate.

Next issue we will discuss the differences, and explore the common CO₂ systems seen in the modern supermarket.



Dave Demma holds a degree in refrigeration engineering and worked as a journeyman refrigeration technician before moving into the manufacturing sector where he regularly trains contractor and engineering groups. He can be reached at ddemma@uri.com.

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ComfortNet communicating control-compatible Goodman units further simplify installation by automatically perfecting the installation/setup process and providing wireless indoor comfort control

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Review*

★★★★★ 4.7

I purchased this equipment after researching the major brands and speaking to several HVAC installers. The equipment is well built and a great value. Goodman has an excellent warranty program. The installer was professional and his workmanship is of the highest quality. I noticed an immediate difference in the comfort of my home. I am impressed at how quiet the unit is. - **smithke**

*Goodman uses the industry leader in homeowner reviews, BazaarVoice, to administer and validate the reviews you see on the website. This means reviews are directly from homeowners, with checks to prevent fabrication, modification, or fraudulent activities. To see how Goodman authenticates reviews, please see BazaarVoice's Authentication Policy at www.goodmanmfg.com



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< SHOW PREVIEW

MEET Show's 22nd edition to be a record breaker

SHOW HOURS

Wednesday May 18, 9 a.m. to 5 p.m.

Thursday May 19, 9 a.m. to 4 p.m.



This spring marks the return of the Mechanical Electrical Electronic Technology Show (MEET), the largest trade event east of Montreal. Scheduled for May 18 and 19 at the Moncton Coliseum Complex in Moncton, NB, the event showcases the latest in products and services. The 2014 edition welcomed more than 6200 buyers – the show's highest attendance in over two decades. Organizers expect an even larger crowd for the 2016 show.



Highlights of the event include the 4th biennial MEET Innovation Awards, which recognize innovative products from exhibiting companies. One award from each of the show's four sponsoring associations will be presented.

The post secondary electrical installations Skills Canada NB contest will be held on May 18. That evening the popular MEET Industry Dinner will feature stand up comedian James Mullinger. Dinner tickets must be purchased in advance.

MEET is sponsored by the Canadian Institute of Plumbing & Heating (CIPH), Electro-Federation Canada (EFC), the Illuminating Engineering Society (IES) and ACME-Atlantic Canada Mechanical Contractors. www.meetshow.ca

EDUCATIONAL SESSIONS

WEDNESDAY, MAY 18

10:00 a.m. ASHRAE's Headquarters Renovation – What Happens When the Leaders Try to Do it Right

Presented by: ASHRAE NB/PEI Chapter

11:00 a.m. Standards, Testing And Certification, Canadian Electrical Safety System, And The 2015 Canadian Electrical Code

Presenter Shawn Paulsen started out as an electrician and later returned to university to obtain a BSc in electrical engineering. In 1999 he became the chief electrical inspector for the Province of New Brunswick. He joined CSA Group in 2009 as manager, conformity assessment and continues in this role today.

1:30 p.m. Opportunities Of The Led Megatrend (AIA Continuing Education)

This seminar takes a closer look at the current LED megatrend and explores the opportunities that new integrated LED luminaires are creating in terms of the energy savings, code compliance, and asset management that is now possible.

2:30 p.m. The Hidden Risks In Emergency Response

Participants will have a clear understanding of the most current ANSI requirements for Emergency Showers &

Eyewash equipment and new insight into the most common gaps in compliance that their clients struggle with. Armed with this knowledge, along with a basic understanding of the recent advances in technology, participants will have a better understanding of how they can impact maintenance costs, safety, ANSI compliance, water consumption, and overall reliability of this type of equipment.

THURSDAY, MAY 19

10:00 a.m. Demystifying Design Light Consortium (DLC) Topics covered will include the structure, function and objectives of DLC, the requirements and process of Qualified Product List (QPL) submission and rebate program integration and implementation throughout the Canadian marketplace.

11:00 a.m. Standards, Testing and Certification, Canadian Electrical Safety System, and the 2015 Canadian Electrical Code

1:30 p.m. The Hidden Risks In Emergency Response (see above for description)

2:30 p.m. Advanced Energy Design Guides – Going Beyond Minimum Standards

Presented by: ASHRAE NB/PEI Chapter

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Warming to the benefits of geothermal technology

The OGA seeks to change the perception of geothermal. BY BETH MCKAY

The Ontario Geothermal Association's (OGA) 2016 conference was held in Kitchener, ON on February 4 and 5. The conference highlighted the environmental benefits of geothermal technology, and also some of the difficulties the industry is facing due to costs and client interpretation and understanding.

On the Thursday evening, the Hon. Glen Murray, Ontario Minister of the Environment and Climate Change, spoke about the effects of global warming and the ambitious targets for energy conservation and greenhouse gas emissions that the Government of Ontario has set.

"It's hard to have the conversation if you don't have your head around climate change," he said. He discussed the abnormal extreme temperatures and environmental effects that the world is experiencing, and has called the current warm winter weather a 'false spring.'

Murray, who is an apparent fan of geothermal, emphasized the need to begin to normalize geothermal and used the rise in popularity of computers as a parallel to geothermal systems. Just as owning a computer normalized over time, Murray believes this is what will happen with geothermal technology. He said that in the 1980s, no one would have wanted a computer in their homes as they were so large and costly, but currently, most people carry a computer around in their pocket. "Geothermal works and it doesn't pollute, and it's net-zero," he said.

The OGA regulatory update was presented by Martin Luymes, HRAI Canada, and focused on the advocacy of geothermal by engaging with the Ontario Ministry of Energy. He called the current interactions with the Ontario Ministry of the Environment and Climate Change "a potential game changer."

Muktha Tumkur, project manager, renewable energy, CSA Group, updated the audience on the status of CSA C448. She said that this code is complete and should be released "any day now." "We believe that this new BSR/CSA448-2016 will prove to be the solid foundation that geothermal/geo-exchange needs to expand the market penetration of this tech-



Derek Statnik(l), Stan Marco and Brian Pescod(r) discuss how to achieve "Net Zero" buildings through Geo-exchange Solutions at the OGA Conference.

nology into the conventional HVAC industry," Tumkur said.

A discussion on achieving net-zero buildings through geo-exchange featured panel speakers Stan Marco of GeoSmart Energy, Brian Pescod from Zon Engineering and Derek Satnik, who is with Mindscape Innovation and the Net-Zero Council. Satnik explained that the Canadian Home Builders' Association (CHBA) has conducted research on what home buyers are looking for in houses.

The CHBA has found that energy efficiency elements are currently a 'must have' for the majority of buyers.

In spite of that, Pescod later explained that some customers do not want a system that does not generate payback within three years. He said that customers need to begin to think beyond the payback period and look to the benefits of geothermal systems.

Paul Bony, director of renewables and contractor development, Electricity and Gas Industry Association (EGIA) explained that although the upfront cost of geothermal is expensive for most homeowners, it is of great importance to move in the net zero direction. "Putting in a geo-exchange system in a typical home is equal in greenhouse gas reduction to taking two cars off the road," he said. He added that organizations such as Habitat for Humanity in Wisconsin have built net zero homes that cost roughly \$80,000, showing net zero is attainable for a variety of customers.

A final panel discussion focused on the approaches to commercial loop financing and featured Dr. Jim Cotton, McMaster University, Michael Savel, Oakville Enterprises Corporation and Tim Weber, Diverso Energy. The panel discussed the developer's challenge to be green, recognizing that geothermal technology is perceived as very expensive. "Geo-exchange is great, but how do you sell it? We need to turn the \$25,000 bill into something else," stated Weber.

At press time, the date for the next OGA meeting was not scheduled.

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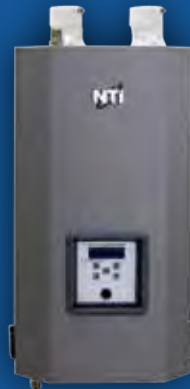
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THE MAGIC KINGDOM OF HVAC/R: ASHRAE ORLANDO 2016

BY ROBERT BEAN

I was in Orlando for the seven day ASHRAE Winter Conference held in parallel with the three day AHR Expo (see p14 for AHR news). It was neither sunny nor warm and lived up to its winter billing. For readers who have not been, the AHR event is generally focused on HVAC/R goods and services with education programs primarily targeted towards the technical trades and distribution network.

It is a strategic fit with the ASHRAE meetings, which are generally about research and Standards; with education programs targeted towards the architectural/engineering professions. Between the two great events there is a lot for the 60 000+ visitors to take in. Regrettably the trade-show floor had my attention for only a few minutes with the balance of my time in these following meetings: ASHRAE Standing Standard Project Committee 62.2 (SSPC 62.2), is responsible for, "Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings." Which means they have great debates over such things as unvented fireplaces. Yes, believe it or not, such products are permitted south of the border. Rather than give you the gory details of what happened I will direct you to Allison A. Bailes III, Ph.D., who did great coverage in his Energy Vanguard blog, "Unvented Gas Appliance Industry Falls Flat at ASHRAE Meeting."ⁱ Since these are so controversial there is a call for further research to examine their health, safety and per-

formance. Personally, no professional I know would recommend an unvented fireplace in a home regardless of what the industry reports or what research reveals.

Kitchen range hoods were also on the agenda. From side bar discussions, LBNL researchers Singer and Stratton point out in 2014 that, "...only 5 of the 3694 range hoods listed in the HVI ventilation products directory (HVI 2013) have rated airflows for 62.5 Pa of static pressure."ⁱⁱ Meaning many sales people likely do not know what their hoods do under load and by extension do not know how they are actually performing in the field. Lawrence Berkeley National Laboratory (Berkeley Lab) is testing hoods and working on developing an ANSI range hood effectiveness Standard to which manufacturers can use to evaluate their products. Unfortunately the test method will not account for all installed variables.

SSPC 62.2 has a lot of very smart people in it and I like to spend my Fridays with them mainly because the really good ones get the importance of dedicated ventilation systems which radiant heating and cooling systems enable. A lot more took place but you will have to wait for the movie.

My second home at ASHRAE is SSPC 55, "Thermal Environmental Conditions for Human Occupancy." We work on refining one of the most important Standards that

continued on 88

John Goshulak of Weil-McLain, recipient of the 2016-2018 Carlson-Holohan Industry Award of Excellence, addresses guests at the Radiant Professionals Alliance (RPA) Annual Social Event at the AHR Expo. RPA executive director Mark Eatherton is in the background. The award



Photo John Mesenbrink of Mechanical Hub

is the original Bell & Gossett sizing wheel invented by Gil Carlson, to help him quickly size and select pipes and pumping systems (it was later mass produced as Bell & Gossett's System Syzer). It is presented every two years to an individual who has dedicated his/her career to growing the steam and hydronics industry through education, marketing and fund raising. Nominations for the award can be made at www.healthyheating.com.



ASHRAE president and fellow Canadian, David Underwood celebrated the publication of the new ASHRAE Cold Climate Design Guide (available from the ASHRAE Bookstore) with a good old fashioned curling match, from left to right, Bert Phillips, Underwood, David Lima and Doug Cochrane. Committee member and ASHRAE director at large Erich Binder took the photo.

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Taco CEO Johnny White Jr. presented the Dan Holohan Lifetime Contribution to Comfort Award to Dan Holohan (seen here) at this year's AHR Expo. The award's inaugural presentation to its namesake was called by White, "just one small token of appreciation for a lifetime of tireless commitment to improving the trade and – in no small measure – homeowner, and business employee comfort, nationally." The award will be given each year to an HVAC professional or company that has made a substantial contribution to comfort technology, advancement, or training while displaying the exceptional good humour and love of people exhibited by Holohan throughout his long career.



John Siegenthaler (I) at the AHR launch of his book, *Heating With Renewable Energy* with Mark Olson of Caleffi looking on. Visit HPAC's booth at CMPX for a chance to win one of three copies of Siegenthaler's book.

ASHRAE publishes (IMHO). Highlights include the addition of a first ever window solar gain comfort calculation which users will see in the near future. Also, I am happy to report my three year role as chair of the Project Monitoring Sub Committee (PMSC) overseeing the development of the first ever Standard 55 User Manual is almost over. This manual should be available in the fall of this year.

The other big thing happening in SSPC 55 is the engagement of the residential sector. Many people still hold fast that Standard 55 is not applicable to residential buildings when in fact ASHRAE has officially ruled that it is; it is referenced by the residential IAQ Standard 62.2 and is listed as a residential resource in the ASHRAE website. So there you go, a left, right and under the chin for you naysayers! The best part is principles from Standard 55 were used in a first real

public example from the U.S. National Association of Home Builders in the design of the coveted, "New American Home."

As recently published; "The new direction also involved using a standard of indoor comfort rarely if ever seen in residential construction...In designing for maximum comfort, human metabolic rates for sitting, sleeping, and being active—while wearing either long sleeves or short sleeves—were closely examined. (D)esigning on the basis of comfort was a big philosophical change,...says Achilles Karagiozis, global director of building science at Owens Corning, supplier of the wall assembly...gigajoules don't make people happy (C)omfort, sustainability, and lasting construction do..."ⁱⁱⁱ

Did you hear that? That was a big Calgary Yahoo! My motto, "design for people-good buildings will follow" scores another touch down.

If I have an ASHRAE Alma Mater it is T.C. 6.5 "Radiant Heating and Cooling." The legacy of greats runs deep in that group with some of the world's best radiant engineers, academics and system manufacturers. We had a sneak preview at the latest radiant modelling tool research project RP-1176. This is an extension to RP-1383.^{iv} Put those together and what you have is \$300,000 invested in useful design tools. Of epic-grand scale interest is T.C. 6.5's participation with colleagues from Denmark, Netherlands, Korea, India, U.S. and Canada as we discussed the Center for the Built Environments' \$3.2 million dollar radiant cooling and heating research project. It is a multi-year project that will include laboratory work at the new LBNL Flex Labs plus a review and study of fifty installed commercial radiant cooling and heating systems.

As an ASHRAE Learning Institute liaison, I am working with T.C. 7.4 "Exergy Analysis for Sustainable Buildings" to develop an Exergy 101 Short Course, in the meantime the program chair is looking for case studies of high eXergy efficient buildings such as Manitoba Hydro Place or the Dageforde Residence.^v Both are radiant conditioned award winning projects featured in ASHRAE publications. If you have a high eXergy efficient project that you want to publicize let me know.

One of the best parts of my job is to mentor to some of the best young minds in industry. Here I got to see one of my students, Uponor's Aaron Stotko, talk fluid fundamentals with the best of them at the T.C.6.1 "Hydronic and Steam Equipment and Systems" meeting. T.C. 6.1 is responsible for many chapters in the ASHRAE Handbooks and over the years has done excellent research work. As an aside, Stotko is a new recipient of the Radiant Professional Alliance - Hydronics Industry's Future Leaders' Award given out to the under 30 crowd.

I do not always make the T.C. 2.1 "Physiology and Human Environment" meetings but I am glad I did. The two discussions that had my attention addressed sleeping rooms and whether ASHRAE should be involved in this subject matter;

and whether temperature and humidity should be set aside when defining IAQ. The former is important because sleeping spaces provide for rest and rejuvenation, which affects the next day's work productivity and academic learning. The latter (which was a side bar), has some merit in retrospect...it has kept me thinking for the past several days.

It is always great to meet with the ASHRAE Cold Climate Design Guide group populated by several fellow Canadians. This new ASHRAE Bookstore publication came out of the Seventh International Cold Climate HVAC Conference held in Calgary back in 2012. The group is now pulling together an ASHRAE lecture series and content for its web site.

Current ASHRAE President and fellow Canadian T. David Underwood, P.Eng., invited me to participate in the new ASHRAE Residential Building Committee where I will be lending my skills and talents to fulfil its Scope and Purpose, while ensuring hybrid radiant based HVAC systems along with thermal comfort principles establish a place within ASHRAE's residential initiatives. On a macro scale it is very important to see the 55 000+ members of ASHRAE as residential assets and partners with existing industry Institute's and Associations. The organization carries influence and gathers respect throughout the HVAC world and is opening up its resources to one of the most important market segments. Let me know if you have an interest in this development and I will direct you to the appropriate persons.

The above is just a very small snap shot from one man's perspective. It is when you join up with those of like mind that the real stuff happens and right now really good stuff is happening at ASHRAE.



Robert Bean, who is president of Indoor Climate Consultants Inc., is a Registered Engineering Technologist in building construction through the Association of Science and Engineering Technology Professionals of Alberta and a Professional Licensee in mechanical engineering through the Association of Professional Engineers, Geologists and Geophysicists of Alberta. He has served two terms as an ASHRAE distinguished lecturer, serves on ASHRAE committees TC 6.1 (Hydronics), TC 6.5 (Radiant), TC 7.4 (Exergy) and SSPC 55 (Thermal Comfort) and is a recipient of ASHRAE's Lou Flag Award.

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Author's note: Views are those of the author and do not necessarily represent the views of ASHRAE.

WHAT **WOWED** ME AT AHR/ASHRAE

“AHR 2016 stood out for attendance numbers and number of registrants/attendees from Canada. I had discussions with visitors related to hydronics—we all observed that there seemed to be less interest and exhibits related to hydronics than in the past. The level of sophistication and technological innovation seemed much higher than at past shows and this seemed more ubiquitous, meaning we have truly begun to embrace it in a meaningful way.”

Mark Evans

HPAC columnist, Viega Director of Sales – Canada

“Lots of visitors from all over the Americas and several new manufacturers of PP-R pipes entering NA. My favourite part was the RPA social event in honour of Dan Holohan, with so many hydronic legends in attendance.”

Lance MacNevin, P.Eng.

Director of engineering – Building & Construction
Division|Conduit Division
The Plastics Pipe Institute

Siggy's top three product picks:

1. The KelitPEX115R from Urecon is a pre-insulated PEX tubing for underground heat distribution with a kevlar jacketing around the PEX allowing operating temperatures up to 115C (239F) at pressures up to 230 psi.
2. International Waste Water Systems, Inc.'s Piranha Wastewater recovery system is a device that holds about 300 gallons of waste water directly from six inch building sewerage line. It uses a refrigeration system to extract heat from the waste water and uses that heat for providing domestic hot water up to 160F. R-134a refrigerant, 160 000 Btuh heating capacity.
3. The Ray Magic Panel from Messana Radiant Cooling is a four foot by eight foot sheet of ½" drywall with PEX tubing and 1.5" foam backside insulation all assembled into a single panel that can be screwed to ceiling framing, finished in the same manner as conventional drywall and quickly connected to the piping in adjacent panels. It can be used for radiant heating or cooling. Based in Italy, the company offers complete controls for the system. The product is distributed in North America from a stocking location in California.

John Siegenthaler, P.E.

HPAC columnist
Principal, Appropriate Designs



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Over 500 exhibitors will fill the 200 000 square foot Metro Toronto Convention Centre, North Building when the Canadian Mechanical & Plumbing Exposition (CMPX) 2016 gets underway in March. In addition to the trade show, the event offers free educational seminars, daily keynotes from industry experts (preregistration is required), the HRAI Skills Centre where visitors can test their skills against the younger set, and a chance to win a Chevrolet City Express van with a customized Farmbro interior (each attendee gets one ballot as they enter the show).

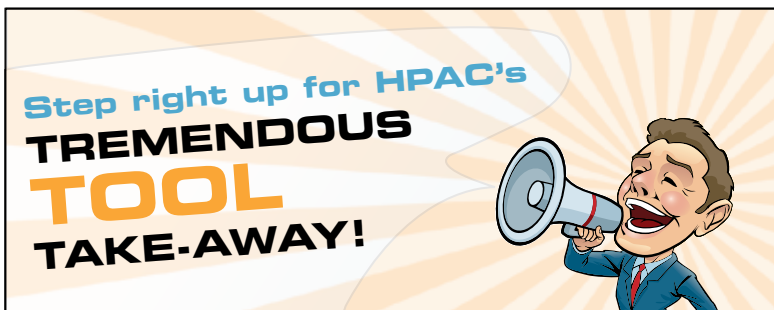
“CMPX, the Canadian Mechanical and Plumbing Exposition continues to be the biggest HVACR and Plumbing Show in Canada and it has achieved an unmatched track record over the past 40 years,” stated show chairman, Gerry Cellucci of Yorkland Controls. “The show theme is “one show – the entire industry” and that is a powerful attraction to exhibitors and attendees alike. CMPX has proven to be the most effective way to meet with the entire mechanicals industry, all under one roof, for three exciting days of networking, education and new technologies.”

The CMPX Connections Show Floor Theatre is a new feature for 2016. This theatre will be the home of CMPX 2016 Learning Forum; a schedule of educational sessions on industry technologies and trends, as well as issues affecting the HVAC/R and plumbing markets.

CMPX attracts a full roster of allied organizations such as ASPE, ASHRAE, AHRI, MCA, MCAT, OPIA, and RSES, who are all going to be at the CMPX show as Honourary Sponsors.

Jointly presented since 1972 by the Heating Refrigeration and Air Conditioning Institute of Canada and the Canadian Institute of Plumbing & Heating, CMPX is Canada’s national trade show for the mechanical industries including: air-conditioning, heating (forced-air and hydronics), plumbing, industrial, waterworks, water quality, piping, refrigeration and ventilation.

WWW.CMPXSHOW.COM



HPAC'S TREMENDOUS TOOL TAKE-AWAY

Drop by HPAC’s booth (N19/N20) at the top of the escalator to enter to win thousands of dollars worth of tools, including a four-valve aluminum manifold, refrigerant recovery machine, AC/DC Clamp Meter with IGM, a VAC smart probe kit, a flameless press technology system, and a wireless HVAC clamp meter. That is right— one winner will take away these “tremendous tools.”

ONLINE REGISTRATION AT WWW.CMPXSHOW.COM (\$10) OR AT THE DOOR (\$20)

SHOW DATES:
March 16-18, 2016

LOCATION:
North Building, Metro Toronto Convention Centre
255 Front Street West
Toronto, ON

WEDNESDAY MARCH 16
SHOW HOURS: 9 a.m. to 6 p.m.

THURSDAY MARCH 17
SHOW HOURS: 9 a.m. to 7 p.m.

FRIDAY MARCH 18
SHOW HOURS: 8 a.m. to 3 p.m.

Breakfast Keynote Presentations are 7:30 a.m. to 9:30 a.m. on the street level and require advance registration at \$25 per person, per session.

Contents

- 92** SEMINAR SCHEDULE
- 102** SPEAKER PROFILES
- 110** FLOOR PLAN
- 113** EXHIBITOR LIST
- 126** PRODUCT SHOWCASE

Tuesday, March 15

2:00 P.M. TO 5:00 P.M.

COMMISSIONING FOR HIGH-PERFORMANCE BUILDINGS

COST: \$184USD (\$139USD ASHRAE MEMBER)

SPEAKER: Walter T. Grondzik, P.E.

ASHRAE Guideline 0 is the focus of this course, which will present the defining characteristics of the ideal building commissioning process as expressed in this guideline. The course will explore the implications of employing the ASHRAE commissioning process for the acquisition of a high-performance building. Particular emphasis will be placed on the value of developing a viable owner's project requirements document that can successfully guide verification of success across the design, construction, and operation phases of a building project.

Continuing Education Credits: This course is recognized by AIA and the Green Building Certification Institute (GBCI) for 3 PDHs/LUs or .3 CEUs.

6:00 P.M. TO 11:00 P.M.

2016 GALA EVENING IN SUPPORT OF HABITAT FOR HUMANITY

Delta Toronto

Join 300 industry colleagues in support of Habitat for Humanity. Enjoy a spectacular meal, comedy improv duo Colin Mochrie and Deb McGrath, and a silent auction. All proceeds support future partnership activities between CIPH and Habitat for Humanity Canada.

Wednesday, March 16

7:30 A.M. TO 9:00 A.M.

THE INTERNET OF THINGS (IOT) – THE OPPORTUNITIES AND IMPACT OF CONNECTED HVAC/R EQUIPMENT AND DEVICES

SPEAKER: Bill MacGowan, Cisco Systems

LOCATION: Street level, beside CMPX registration area

Admission: \$25 pp includes continental breakfast. Advance registration is recommended.

With billions of connected devices projected in the next five years, the HVAC/R industry will not be immune to the increasing expectation of its customers to save money, access new services and increase comfort. This trend presents opportunities for manufacturers and service providers to create enhanced services that will have greater value than the intrinsic original cost of the equipment or product.

8:30 A.M. TO 10:00 A.M.

ASPE GREATER TORONTO AREA MONTHLY MEETING

Backflow Prevention in the GTA

LOCATION: Room 205D

Admission: \$25.00 includes the meeting, continental breakfast and free admission to the CMPX 2016 exhibits and Learning Forum sessions.

9:00 A.M. TO 12:00 P.M.

ASHRAE STANDARD 188-2015 – SUCCESSFULLY MANAGING THE RISK OF LEGIONELLOSIS

COST \$184USD (\$139USD ASHRAE MEMBER)

SPEAKERS: Bill Pearson and Michael Patton

Legionellosis is a health and safety concern for facility owners and operators, and for those who de-

ENTER TO WIN SIGGY'S LATEST BOOK

Don't miss the opportunity to win one of three copies of John Siegenthaler's newbook: Heating with Renewable Energy at HPAC Magazine's booth at the top of the escalator.



continued on 94

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From a brand you have come to trust comes a new series of water heaters. Introducing our new **Tank-Tankless Crossover TTX Series**. The TTX Series from **GIANT** delivers a convenient way to increase hot water capacity as well as comfort without complicating installation as it installs just like a regular water heater making it perfect for same-day replacement.

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The new Tank-Tankless Crossover TTX Series from **GIANT**.
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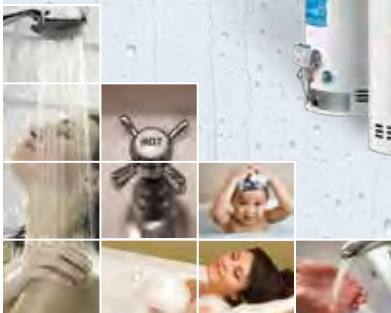
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sign, manage, and oversee building water cooling systems. This course describes the environmental conditions that promote the growth of Legionella in water systems, and the locations where Legionella control measures can be applied in new and existing buildings. ASHRAE Standard 188-2015 establishes the minimum legionellosis risk management requirements for the design, construction, installation, commissioning, operation, maintenance and service of centralized building water systems and components. A comparison between general compliance and compliance for certain health care facilities will be provided. The course focuses on the compliance with Standard 188-2015 to provide a safer and healthier building environment.

Continuing Education Credits: This course is recognized by AIA for 3 PDHs/LUs or .3 CEUs.

10:00 A.M. TO 11:00 A.M. BREAKING OUT OF YOUR CURRENT BUILDING AUTOMATION SYSTEM

SPEAKER: James Breckenridge

LOCATION: CMPX Show Floor Theatre

Admission: Free with CMPX 2016 visitor badge

Many owners of older facilities feel locked in by their current BAS provider. With today's open connectivity solutions it can be easier than ever to change providers and get competitive solutions to BAS challenges. Learn the key components to an open system and some of the challenges associated with implementing it. What can you really expect a different provider to be able to do? Perhaps it is time to expand your existing BAS; what should you do to ensure it is ready for the Internet of Things? How can you start turning your facility into an intelligent building? Maybe you have an opportunity for a new building: learn how to avoid the pitfalls that will lead to a locked in system.

11:30 A.M. TO 12:30 P.M. GREASE INTERCEPTORS—ENGINEERING WITH CONFIDENCE

SPEAKER: Chris Atwell, CSC, CSI

PRESENTED BY: ASPE GTA

LOCATION: CMPX Show Floor Theatre

Admission: Free with CMPX 2016 visitor badge

This session will cover the impact of excessive fats, oils, and grease (FOG) on the sanitary sewer system. Participants will: gain an understanding of the existing statistics surrounding the negative impact of poor grease management practices and the sanitary sewer system; identify and comparatively value the generic types of Grease Interceptor (HGI, GGI, GRD); have a clear understanding of the North American Grease Interceptor performance standards (ASME A112.14.3, PGI G101, CSA B481.1, IAPMO/ANSI Z1001); and learn how to properly size a grease interceptor and be able to confidently provide an engineered recommendation; providing the optimum grease management solution for a given application.

1:00 P.M. TO 2:00 P.M. COMMERCIAL WATER HEATER SAFETY CONCERNS

PRESENTED BY: ASPE GTA Chapter

SPEAKERS: Ned Towle, president Towle Whitney LLC

LOCATION: CMPX Show Floor Theatre

Admission: Free with CMPX 2016 visitor badge

This presentation will review the responsibilities and limitations of the modern water heater, based on changes implemented by Authorities having Jurisdiction. Different options will be discussed for protecting the T&P, and the water heater, from explosions. Topics include: who is responsible for water heater safety; evolution of the closed system; introducing chemicals to the water; effects of closed system and chemicals in a hot water environment; controlling thermal expansion; why 13 line items in the plumbing code really do not matter; and use of the CSA-1US (Safe Plug Relief) to protect T&P threads.

continued on 98

PRESENTED BY
SHOW & TELL UEI



UEi's New Clamp Meter Design Reflects Marketplace Changes

We all know that wireless technology impacts us every day. How it will be used in the HVAC/R industry is still being worked out but UEi is committed to providing today's professionals with the ability to use the information they need whenever and wherever they need it.

Just as the advent of digital technology changed the analog world, so wireless technology will inevitably change the world of test and measurement. By enabling products to serve multiple applications and professionals to use data easily in a different location from where they gathered it, UEi anticipates substantial and irreversible changes in the HVAC/R test and measurement industry. Companies like UEi can only implement these changes successfully by working closely with their customers to find ways to use this technology that add value.

The DL429 is one of the first clamp meters to use this technology but it is first and foremost an outstanding tool designed specifically for HVAC/R professionals. The wireless feature allows professional contractors to utilize the power and versatility of their compatible mobile device to transform their workflow. This combination of using new technology to enhance outstanding products is one part of UEi's approach to this change in the market place.



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The unit is designed to work with a rear discharge toilet and can accommodate a full bathroom including toilet, sink, shower, bathtub and even a washing machine (indirectly). It discharges waste up to 25' vertically and 150' horizontally, while operating quietly with sound-absorbing technology.

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Let the solution sit inside the toilet and pump for six to eight hours, then reconnect the main power, water supply and flush the toilet a couple of times to ensure the unit is ready to use.

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Thursday, March 17

7:30 A.M. TO 9:00 A.M. LOW AMBIENT AIR TO WATER HEAT PUMPS—AN EMERGING RENEWABLE ENERGY HEAT SOURCE
SPEAKER: John Siegenthaler, P.E.

Admission: \$25 per person includes continental breakfast. Advance registration is required.

When it comes to combining heat pumps with hydronics, the common approach has been to use geothermal sources. However, recent advances in “low ambient” air source heat pumps present a viable alternative, even in cold Canadian climates. This session will discuss the basics of low ambient air-to-water heat pumps and give examples of how they can be combined with hydronic heating and cooling distribution systems. It will also compare the performance and cost of such systems to that of a geothermal-source water-to-water heat pump system.

8:00 A.M. TO 10:00 A.M. HRAI MANUFACTURERS AND WHOLESALERS BREAKFAST MEETING
SPEAKER: Nathan Janzen, Senior Economist with RBC Economics Research
 HRAI’s Wholesalers Division will host its 18th Breakfast Meeting for wholesaler and manufacturer members. Nathan Janzen, senior economist with RBC Economics Research will enlighten attendees on financial market developments in Canada and the U.S.

8:00 A.M. TO 11:00 A.M. IPVF RECEPTION AND BREAKFAST
SPEAKER: Toby Mack, president and CEO, Energy Equipment and Infrastructure Alliance
LOCATION: Room 205D
Registration: \$79/pp

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Fernox and Hydronic Agencies are excited to introduce our ground-breaking new commercial filter, the TF1 DELTA FILTER. The TF1-Delta is designed specifically for commercial applications and is suitable for large volume, low temperature heating and cooling systems. It protects vital components from magnetic and non-magnetic debris as well as removes trapped air from within the system. The filter works by utilizing hydrocyclonic action to deliver contaminants to the unit’s specially designed magnetic assembly, successfully removing and containing them from the circulating system water.

The TF1-Delta is complemented by the new range of pre-mixed Alpha-11 Fernox inhibited glycols. We invite you to stop by our booth where we will be showcasing the Fernox range of products including the quick-dose Express cans, our commercial HVAC line of cleaners, inhibitors and, new in 2016, our DS-40 Commercial De-scaler.



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8:30 A.M. TO 12 NOON **COMFORT AND EFFICIENCY OF RADIANT HEAT/COOL SYSTEMS AND THERMALLY ACTIVATED SYSTEMS**
SPEAKER: Fred Bauman
LOCATION: Room 206 E/F
 Sponsored by Viega. Open to all CMPX delegates

10:00 A.M. TO 11:00 A.M. **COMMISSIONING AND INSTALLATION PRACTICES**
Location: CMPX Show Floor Theatre
Admission: Free with your CMPX 2016 visitor badge
 Proper HRV/ERV installation techniques are just as important as good design and selection practices. It all starts with having the system installed by a qualified contractor who has taken ventilation installation training. The contractor, with proper training, will learn some of the vital aspects that ensure a home is ventilated properly, such as proper balancing, correct installation mounting and best location options. A poorly installed system will not provide the correct amount of ventilation and undo any efficiency gains, resulting in an unhappy homeowner. This session will enforce the benefits of good HRV/ERV installation practices and the need for proper training.

11:30 A.M. TO 12:30 P.M. **HEAT UP YOUR HYDRONICS SALES: TIPS TO GROW YOUR BUSINESS**
Location: CMPX Show Floor Theatre
Speaker: TBA
 Presented by the Canadian Hydronics Council
Admission: Free with your CMPX 2016 visitor badge

continued on 100

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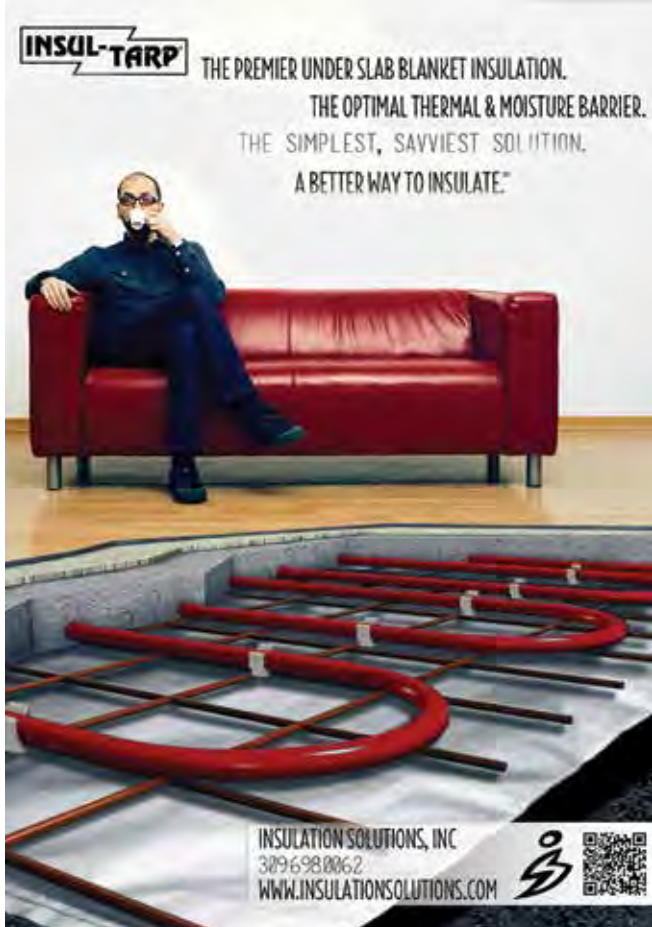


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You will leave this session armed with ideas and tools to increase your sales including: the top benefits of hydronic heating for homeowners; trends in hydronic heating; five ways to promote your business via social media; how to identify the right customers; and opportunities through referrals.

1:00 P.M. TO 2:00 P.M. IT IS TIME TO CHANGE THE UNCONVENTIONAL THINKING IN CONTROLS

SPEAKER: Matt Mikka, technical advisor, Full Gauge Controls

LOCATION: CMPX Show Floor Theatre

Admission: Free with your CMPX 2016 visitor badge

This session will cover the benefits and savings in using electronic controls including size, accuracy, cost saving, long life cycle, and using data logging to meet safety and health authority requirements.

2:30 P.M. TO 3:30 P.M. FLUID QUALITY FOR HEALTHY HYDRONICS

SPEAKER: Bob Rohr

LOCATION: CMPX Show Floor Theatre

Admission: Free with your CMPX 2016 visitor badge

The fluid you choose, treat and monitor becomes the lifeblood of the hydronic systems you install and maintain. The fluid determines the performance and life expectancy of the heating or cooling appliance, as well as the many pumps, valves, components, and wetted surfaces.

7:00 P.M. RSES CANADA ANNUAL GENERAL MEETING

LOCATION: TBA

Friday, March 18, 2016

7:30 A.M. TO 9:00 A.M. WHAT YOU NEED TO KNOW ABOUT CHANGING REFRIGERANTS AND REFRIGERANT REGULATIONS

SPEAKER: Rajan Rajendran, Emerson Climate Technologies

Admission: \$25 per person, which includes a deluxe continental breakfast. Advance registration is required.

The refrigeration landscape continues to change. The new generation of HFC refrigerants are 'under fire' as government regulations globally push manufacturers to devise lower global warming potential (GWP) products. Environment Canada and the EPA (US) have introduced proposed regulations to curb the use of high GWP refrigerants. New refrigerants and traditional alternatives are being introduced with different composition and characteristics compared to the past and present refrigerants used today. The supply chain will need to change (again) to deal with these new refrigerants and their uses. This session will provide attendees with an overview of what GWP refrigerants will mean to the industry, what types of new refrigerants will be used in HVAC/R equipment and systems and what the regulatory landscape that is driving these changes looks like.

8:30 A.M. TO 12 P.M. WATER QUALITY—LEGIONELLA PREVENTION

SPEAKER: Tim Keane

LOCATION: Room 206 E/F

Sponsored by Viega. Open to all CMPX delegates.

10:00 A.M. TO 11:00 A.M. HIGH EFFICIENCY WATER HEATERS

SPEAKER: Gord Cooke, Building Knowledge

LOCATION: CMPX Show Floor Theatre

Admission: Free with CMPX 2016 visitor badge

A detailed technical presentation that will showcase new products and their common installation issues, along with a set of troubleshooting solutions to be provided. A sales tool/guide for contractors for use with homeowner to effectively communicate the advantage of new products and ensure seamless installation. The focus will include all fuel types including natural gas, electric and oil water heaters.

SEE SPEAKER PROFILES on page 102

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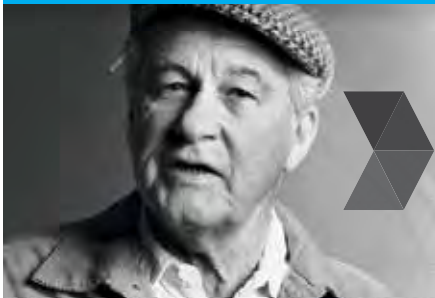


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Chris Atwell is an expert on commercial grease management. Having successfully implemented the technical sales program at Canplus Industries, Atwell now focuses on delivering continuing education courses to engineers, specifiers, architects, owners, developers, city officials and contractors across North America.



Fred S. Bauman, P.E., is a project scientist at the Center for the Built Environment at UC Berkeley. He received an MS degree in Mechanical Engineering from UC Berkeley, and a BS in Mathematics from Harvey Mudd College. Bauman led the development of CBE's renowned under floor air distribution (UFAD) research program and is currently leading CBE's research program on advanced integrated systems with a focus on radiant slab cooling (thermally activated building systems, TABS).



Bauman was the author of the first UFAD Design Guide, published by ASHRAE in 2003, and was a lead contributing author, as a voting member of ASHRAE TRG7-UFAD, of the newly revised UFAD Guide, published by ASHRAE in 2013. A recipient of the ASHRAE Distinguished Service Award, Bauman is an active member of ASHRAE, having served previously as Chair of TC 5.3 (Room Air Distribution) and Chair of SPC 113-1990 (Method of Testing for Room Air Diffusion).

James Breckenridge has been working in the areas of building automation and HVAC controls for 20 years in various functions, from field hardware verification to programming, engineering design, and sales. He is often approached for advice on the viability of various control solutions. A graduate of University of Waterloo's mechanical engineering co-op program, he is a director at HTS Engineering Ltd., an independent HVAC manufacturer's representative with seven offices in Ontario.



Gord Cooke, P.Eng., president of Building Knowledge Canada and Air Solutions, has over 30 years of experience in the low and high-rise residential building industry. An educator, industry consultant, and presenter, Cooke has a unique talent for taking the building science issues that he sees in the field, and presenting them in an easily understood and practical real-world manner. He has particular expertise in applied building science, energy efficient housing initiatives, innovative HVAC systems, ventilation, and Indoor Air Quality (IAQ). He has developed and delivered a multitude of workshops in these fields, as well as a sales and marketing course for builders and real estate agents to help them best promote the features and benefits of high performance houses.



Walter T. Grondzik, P.E., LEED AP, an architectural engineer, is a Professor of Architecture at Ball State University. He is author of Principles of Building Commissioning and co-author of Mechanical and Electrical Equipment for Buildings (12th ed.) and The Green Studio Handbook (2nd ed.). Walter's interests include building commissioning, sustainability and high-performance building initiatives, and all areas of environmental control systems and their effects on buildings and occupants. He is an ASHRAE Fellow and a Fellow of the American Solar Energy Society.



Tim Keane is a recognized expert in Legionella control. He has investigated numerous legionnaires' disease outbreaks in North America. He has been an original member of ASHRAE 188 committee for the past 10 years, has authored numerous papers and presented at numerous scientific and industry meetings on the issue. He has provided training to engineers, plumbing designers and building operators for over a decade on best practices for controlling



continued on 104

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Legionella in building water systems. He has 25 years experience in industrial and commercial water treatment consulting, with the last 10 years being focused on waterborne pathogen control. Keane also has 10 years experience as a Project Engineering Manager both in new construction and facility operations.

He has worked with healthcare, commercial, institutional, industrial and municipal facilities in the U.S. and internationally and has been involved in the following areas: new construction plumbing design review, waterborne pathogen risk management program development and implementation, plumbing system risk assessments, outbreak investigations and consulting on water treatment issues.

Keane has given several presentations on groundbreaking issues related to Legionnaires' disease. He has presented at the American Water Works Association (AWWA) 2012 Water Quality Technology Conference, the International Emerging Technology Symposium and the 2014 American Society of Plumbing Engineers (ASPE) Convention. See his article on the true nature of outbreaks associated with building potable water systems in HPAC October 2015.

Bill MacGowan is a vertical solutions architect (VSA) for Cisco's Smart + Connect Real Estate and Smart + Connected Communities business team in Canada. Through the practical experience of building and positioning an independent controls company and then focusing on customer needs (performance, sustainability, energy) on a national and global basis, MacGowan has developed considerable knowledge in the arenas of converged building systems, enterprise integration and the delivery of high performance business value. He is an honours graduate of the Queens University electrical engineering program and is a Certified Energy Manager (CEM) with the American Energy Engineers (AEE) Association.



A mechanical engineer, **Matt Mikka** is a technical advisor with Full Gauge Controls. A self-described designer and innovator who is working to incorporate products to create a new level of efficiency in the refrigeration industry, Mikka has worked in the refrigeration installation and repair industry for over 20 years. His interests include application engineering, future-proofing, sustainability and adapting remote

digital control to, just about any segment of the refrigeration market, bringing contractors and equipment close together even from a distance. Mikka is enthusiastic about educating contractors on alternate controller possibilities in a down to earth "real world" eye-to-eye approach without a suit and tie.

Michael Patton is currently the international sales manager for Griswold Water Systems. He has more than 30 years of mechanical engineering experience, including stints with mechanical contractors and with a manufacturers' representative. An ASHRAE Member, Patton is active on two technical committees related to his field. For 10 years, he has been a member of Standards Project Committee 188 Legionellosis, Risk Management for Building Water Systems; and Standard 191P, tasked with crafting a blueprint for efficient use of water in buildings. He was also appointed to the ASHRAE Handbook Committee. Before joining Griswold Water Systems, Patton was vice president of sales for Evandtec in Toronto.



Bill Pearson II is vice president and director of sales, consulting & technical services for Southeastern Laboratories Inc. He is a Certified Water Technologist (CWT) and has more than 40 years experience in the water treatment industry. Pearson has been active in many water treatment technical trade associations and currently serves as liaison for the Association of Water Technologies (AWT) to ASHRAE and the Cooling Technology Institute (CTI). He is a past-chair of the Water Treatment Technical Committee at ASHRAE and AWT, and he is a voting member on the ASHRAE SSPC for Standard 188 (Legionella). Pearson served on the AWT board of directors, was president of AWT in 2003, and received the Ray Baum Memorial Water Technologist of the Year Award in 2005. He is a biochemistry graduate of East Carolina University and a member of the American Chemical Society (ACS) and the National Association of Corrosion Engineers (NACE International). He lives in Raleigh, North Carolina.



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Rajan Rajendran is vice president, System Innovation Center and Sustainability at Emerson Climate Technologies. In this role, Rajendran was responsible for overseeing the new Emerson Innovation Center, also referred to as “The Helix,” through its development, construction and launch phases, before leading its operations after the Center opened on the University of Dayton campus in late 2015.



Schooled by the United States Navy for “pumps and valves” **Ned Towle** did his time as MR (machine repair) in the Navy aboard the USS Wasp CVS -18, and later gained his master plumber’s licence. He worked for years in the



plumbing industry, before working at Watts Regulator and Febco. Towle started Towle-Whitney in 1994 with the resolve that has led the Towle Whitney company into the booster pump industry. Recently, he has focused most of his time and energy on water heater safety.

John Siegenthaler, P.E., is a mechanical engineering graduate of Rensselaer Polytechnic Institute, a licensed professional engineer, and Professor Emeritus of Engineering Technology at Mohawk Valley Community College. A regular contributor to HPAC, “Siggy” has over 30 years of experience in designing modern hydronic heating systems including several using renewable energy subsystems. He is a hall-of-fame member of the Radiant Panel Association. Siegenthaler is principal of Appropriate Designs – a consulting engineering firm in Holland Patent, NY.



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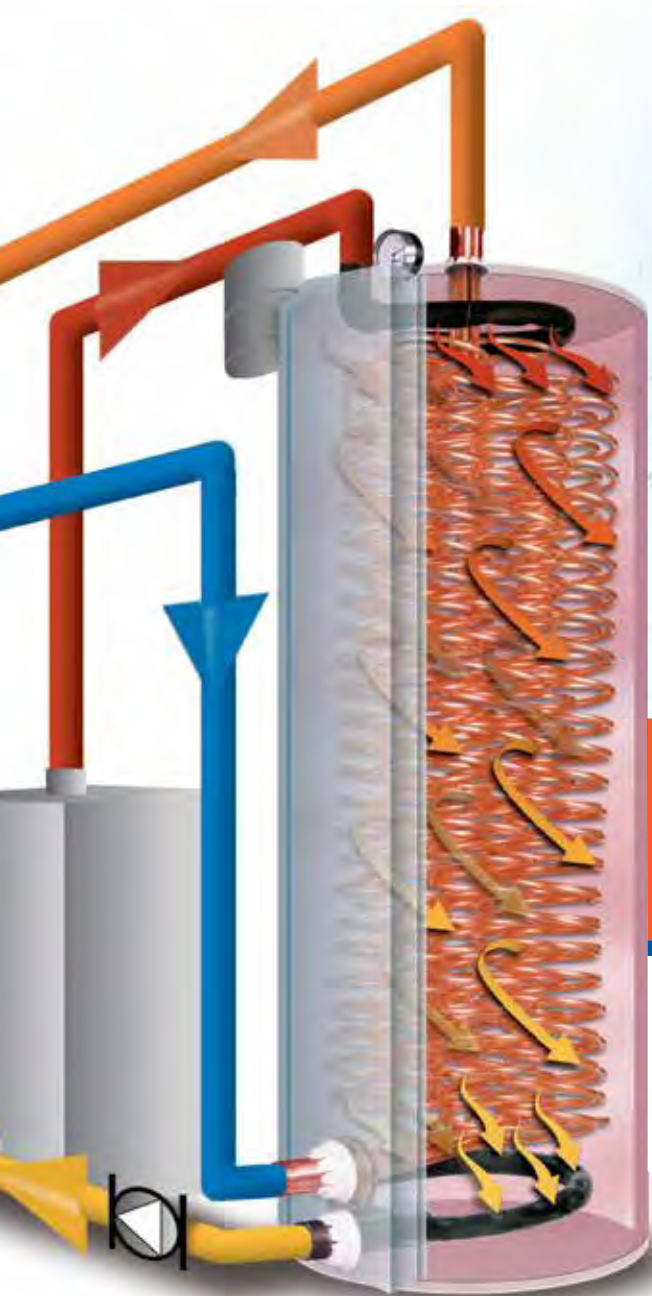


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Greenstar is ideal for providing comfortable heating and domestic hot water for a townhouse, condo, apartment or single family home.

The Bosch Greenstar Boiler combines both space heating or domestic hot water and space heating in a compact, money-saving package. The ultra-high efficiency saves carbon dioxide emissions. The Greenstar is available as a space-heating wall mounted boiler for connection to a hot water tank with unsurpassed performance and control. With special insulation to ensure ultra quiet operation and the exclusive keypad safety lock feature to prevent unwanted tampering with heating controls, this unit is the ideal "green" upgrade for detached and terraced houses and is also suitable for apartments.

- Boiler setup with separate circuits for heating and a DHW tank
- Ideal replacement solution where the existing DHW source will stay in place
- Perfect for systems with a very high DHW demand as the tank can be matched to the hot water requirement without necessarily having to increase the boiler output
- For use with renewables like solar thermal to reduce the energy consumption even further

Greenstar Wall Mounted "Combi" (combination) unit with space heating and integrated water heating in one highly efficient, compact unit. With special insulation to ensure ultra quiet operation and the exclusive keypad safety lock feature to prevent unwanted tampering with heating controls, this unit is the ideal "green" upgrade for detached and terraced houses and is also suitable for apartments.

- Boiler with an integrated system for providing instantaneous DHW
- All-in-one solution with very low installation effort and very few external components
- Ideally suited for smaller properties with low to medium DHW demand and relatively short hot water pipe runs
- Smallest footprint suits properties with little space in the utility room – frees up space that could otherwise be used

With just the right fit, the Greenstar is available as a heat only boiler, which can also be paired with an indirect hot water tank for domestic hot water, or as a combi model for heating integrated with tankless domestic hot water (DHW).

- **Wall Mounted:** No floor space required
- **Floor Standing:** Ideal for replacing old floor boiler

You can trust Bosch to build using the finest quality materials and test to the highest standards. That's why Bosch backs each product with the most generous warranties in the industry. 5-year parts and labour limited warranty, plus a lifetime heat exchanger limited warranty.

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The Buderus SSB Stainless Steel Boiler specifically tailored by Bosch.

Featuring an efficiency of 96%, the Buderus SSB is loaded with standard features that include 5:1 turn down ratio; on-board control with weather compensation; mod-bus connectivity; a 2 wire cascades link; push terminal wiring; and a host of venting options. The SSB boilers are CSD1 compliant thanks to built in LWCO and adjustable manual reset high limit. The Buderus SSB boiler has a full 10-year warranty on the heat exchanger and is available in 255, 399 and 512 MBH.

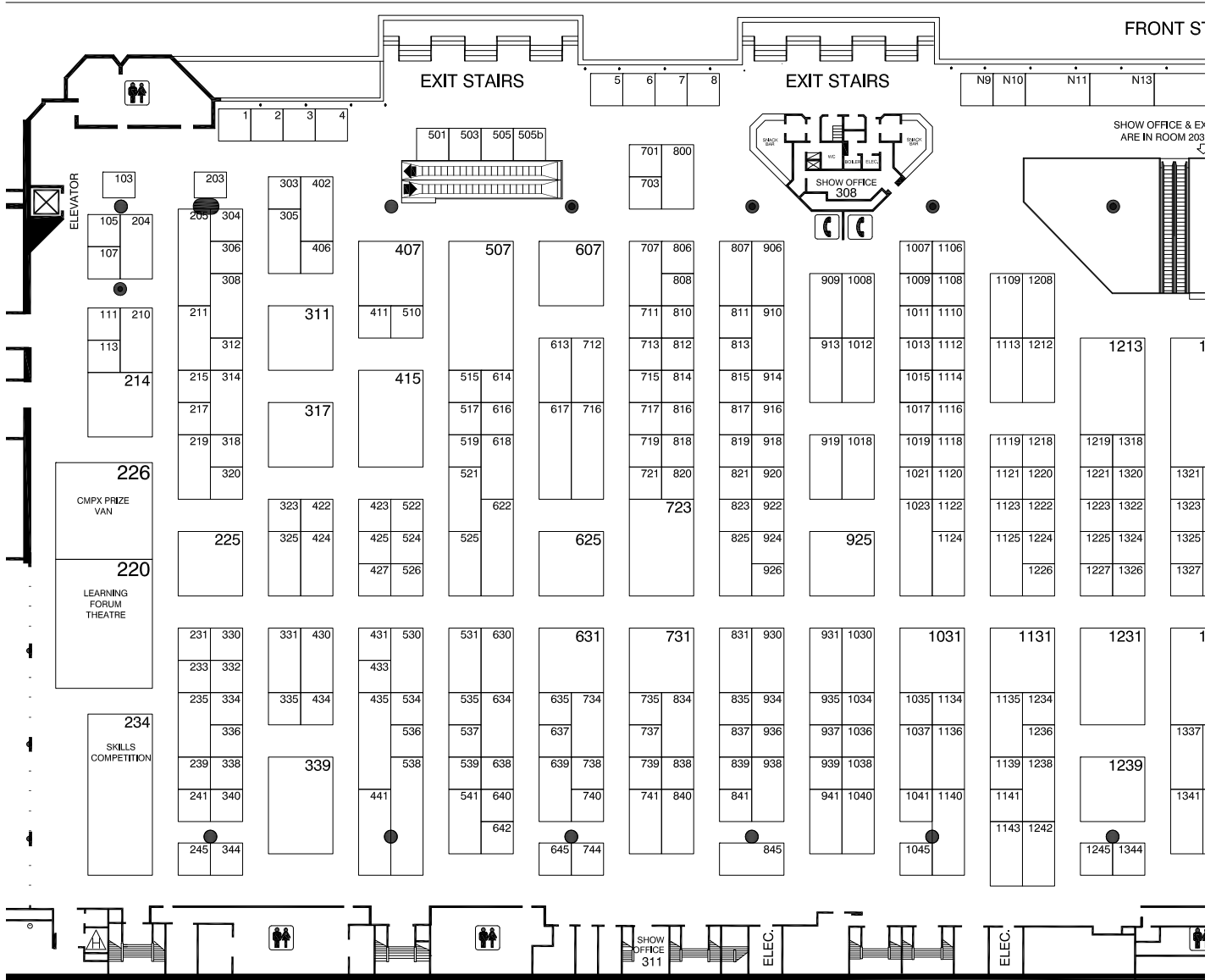


Not just another stainless steel boiler. A single platform design for all SSB's makes installation and commissioning easy, regardless of the output required. The Buderus SSB boilers achieve a unique consistent combustion throughout the entire length of the burner tube thanks to a patented, laser perforated design. Feature rich with a peace of mind warranty, the SSB Boiler has all the quality you have come to expect from Bosch.

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The Powers IntelliStation™ Smart Mixing and Recirculation System is used for domestic hot water in commercial and institutional facilities. It can be integrated with a building automation system (BAS). The IntelliStation provides:

- A smart controller with 3.5" full-colour touchscreen interface
- Digital temperature regulation within +/-2°F to ASSE 1017
- Field configurability, without the need for a laptop or special software



Watts Dead Level® Trench Drains are huge labour savers, typically installing in half the time of competitive systems.

- Sound, functional construction reduces likelihood of jobsite issues
- Design and material compliance satisfy specification and code requirements
- Clean installations in 1-foot increments require no field cutting or modification
- Drains are priced and shipped by the foot complete, simplifying ordering

The tekmarNet® 485 Internet Gateway provides HVAC system-wide remote access from any web browser. It is used to:

- Remotely adjust setpoints and schedules for up to 96 thermostats
- Remotely operate and monitor snow melting and hot tub systems
- Monitor boiler and DHW temperatures and equipment
- Connect with Wi-Fi or Ethernet



Watts Model 919 Backflow Preventers have a bronze body construction.

- Separate access covers for check and relief valve ease maintenance
- Compact modular design facilitates maintenance and assembly access
- They come in 1/4" – 2" (5 – 50mm) sizes
- These backflow preventers are used for protection at health hazard cross-connections, containment or isolation positions

Watts Radiant ThermalPro Boiler Stations are simple pre-piped, insulated pumping stations for mechanical rooms.

- Available in a variety of non-mixed and mixed configurations
- Come with supply and return connections, check stop, isolation valves
- Multiple units can be assembled efficiently (in minutes)
- Installable individually or on header for up to five units



Exhibitor	Booth	Exhibitor	Booth	Exhibitor	Booth
A					
A.M.T.S.	1109,1111	Axiom Industries	434	Castle Access Panels	1731,1733
A.O. Smith/John Wood.....	2023-2027/2122-2126	Aztec Washer Company	1038	CB Supplies	2138
ACCOR Technology	1139	B			
ACCP Custom Plumbing Parts....	1522	Bacharach	816	CCTF Corporation	1222
ACO Systems	1836,1838	Bad Dog Tools	701	Centennial College.....	239
Acoustiguard-Wilrep.....	839	Bardon Supplies Limited..	1439,1441	Centrotherm Eco Systems.....	2136
Adams Mfg. Co.	1124,1126	Baumen Associates Limited	1709,1711	Chemfax Products.....	2339
Addison Fleet	738,740	Belimo	1941	Cliplight Manufacturing	1715
Adrian Steel Company	115	Berner International Corporation ..	303	Coldmax EMC	2610
AHRI-Air-Conditioning Heating & Refrigeration Institute.....	1940	Bibby-Ste-Croix.....	1807-1811	Conbraco/Apollo Valves	1445,1544
AIC Heat Exchangers	1822	Biddle Air Systems/Thermoscreens Canada.....	1634,1636	Construction News & Report Group.....	2340
Aimco International	1423	BITZER Canada	1231	Continental Fan Canada	1007
Air Force 1 Sales & Marketing	330	Blanco Canada	834/836	Continental Fireplaces.....	2434,2438
Air King Limited.....	1120	Bosch Thermotechnology	741,743	Cooling Tower Maintenance.....	1238,1240
Airdex Corp.	1425	Boshart Industries	1030,1032	Coorstek	1709,1711
Airmax Technologies.....	2324,2326	Bradford White Canada	1313	Cozy Heating Systems LLC.....	916
Air Vent Metal Products	336	Brant Radiant Heaters	2140	CPI Industry	7
Aitons	2331	BrassCraft	1837	CPS Products	219,221
Allied Air Enterprises	1531	Brenelle Enterprises	411	Crantock Limited.....	2538
Allpriser	823	C			
Alltemp Products Company	1322,1323	Calefactio	1344	CSA Group	2335,2337
Alpha Controls & Instrumentation.	934	Caleffi North America	825,827	Custom Coils.....	1709,1711
Amaircare	918-926	Camus Hydronics.....	707,709	D	
American Standard	1615	Canada Controls (Part of McKay Boilers)	2036,2038	Dafco Filtration Group.....	1538
American Technical Publishers ...	1419	Canada Metal (Pacific)	637	Dahl Brothers Canada.....	1914,1916
Amvic	2509	Canadian Consulting Engineer ...	1141	Data-Basics	103
Answer Plus	245	Canadian Copper and Brass Development Association	640,642	Dayus Register & Grille	1112
ANT Technologies	505	Canadian General Filters Limited..	925	Dectron.....	1212,1214
Anvil International.....	1436/1438	Canadian Hydronics Council	515	Deflecto	1113,1115
Appion	1936	Canadian Institute Of Plumbing & Heating (CIPH)	N13,N14	Delta.....	1839,1841
Aprilaire	1520	Canadian Oil Heat Association ...	2629	Delta Products Corporation	1817
Aquatherm	1938	Canarm	1239	Desco	913,915
Arkema Canada.....	2435	Canature WaterGroup	407	Desert Spring Products.....	918-926
Armacell	2020	Cancoil Thermal Corporation	1801	Desiccant Rotors International Pvt.	1134
Armstrong Fluid Technology	2534/2536	Canplas Industries.....	335	Dettson Industries.....	1625
ASHRAE	N21	Cardinal Sales (2006).....	814	Direct Coil	1012,1014
ASPE-American Society Of Plumbing Engineers.....	2627	Carlisle HVAC/Dynair	430,432	Diversitech	914
ASPE Greater Toronto Area Chapter	2627	Caroma/ITP c/o Armco.....	2020	Dobbin Sales	1925,1927
Aspen Canada	1719	Carremm Controls	1645	Don Park.....	2045,2144
Atmosphere.....	1125,1127	Carrier Enterprise Canada	2315	Dormont Manufacturing	1709,1711
				Ductmate Canada Limited.	1208,1210
				Duro Dyne Canada.....	538,540,544
				Dwyer Instruments	807,809

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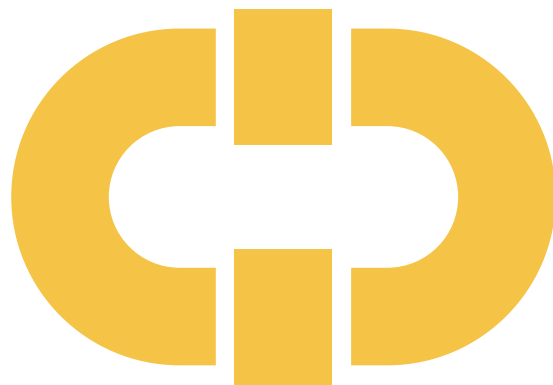
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Exhibitor	Booth	Exhibitor	Booth	Exhibitor	Booth
E		Formadrain.....1912	HTP415		
E.J. Walsh & Co.....2245		Franke Kindred Canada1821	HTS1337,1339		
E.S. Gallagher Sales1512		Franklin Electric/ Little Giant2318,2320	HVAC Rentals.....2531		
Eastern Foundry & Fittings.....111		FreshAire UV332	HVAC Xchanger739		
ebm-papst.....1119		Fujitsu General America ...1011-1015	Hydronic Agencies713		
ecobee.....819		Fulton Companies.....817	Hydronic Heating Technologies.....537		
Ecometal Recycling1420		G		I	
Ecotherm630,632		G.F. Thompson Co.....1008,1010	IAPMO R&T1717		
Eden Energy Equipment2017,2019		G7 HVAC1944	IBC Technologies.....716-720		
EMCO Corporation.....331/333		General Pipe Cleaners2007-2011	ICC-RSF910,912		
Emerson1224,1226,1509,1607		Gerber Canada (Globe Union) 204,206	Imperial.....616		
Emerson Process Management3		Giacomini Canada.....519	Imperial Manufacturing Group (IMG).....2119		
Empire Machinery & Tools.....731		Giant Factories2619-2623	Inficon.....2622		
EnerCare2141		Goldstone HVACR645	Insta Insulation1812		
Enertech Global LLC938,940		Goodman Co. Canada1213	Insulation Solutions811		
Engineered Air.....1640,1642		Goodway Technologies Corp.....2015	International Power Systems.....2241		
Enolgas USA.....24		Gordon R. Williams Corp.1834	Ion Technologies.....2538		
Environmental Systems Corporation402,404		Gossorporated.....2622-2626	Ipex2031,2033		
Equipco.....2523-2527		Granby Industries712,714	ISCO Canada2620		
ESAB/Victor Technologies-Turbo Torch1040,1042		Great Lakes Copper.....1422	Islandaire813		
Etal S.A. de C.V.2622-2626		Gree Canada2441	J		
Excalibur Water Systems1907		Gripple1923	J.J. Downs Industrial Plastics1		
Express Radiant517		Grundfos211,213	J.L. Wingert Co.....1143,1145		
F		H			
FabricAir1417		Hart & Cooley918-926	Jaga.....2017,2019		
Fairview1034		Hartland Controls1709,1711	Jak Tool1318		
Fantech.....1431-1435		Hathorn Corporation841	JB Industries2622-2626		
Farmbro723		HeatLink Group639,641	Jim Pattison Lease323		
Fernco Connectors/Armco2018		Heat Saving Systems.....918-926	K		
FieldBoss1035		Hebdraulique/Flexweld1813	KDI2615		
Fielding Chemical Technologies..1720		Hervy23	Keeprite Refrigeration1523		
Fieldpiece Instruments1913		Hetek Solutions.....217	Kidde-Fenwal.....1709,1711		
Financeit.....1739		Hilti (Canada) Corporation....2543,2545,2642,2644	Kilmer Environmental617-621		
Fleetmatics.....113		HiMark OSTC.....800/802	KIMO Canada (div of Chevrier Instruments)1823		
Flex Energy1735,1737		Holdrite.....703	Klein Tools918-926		
Flexmaster Canada631		Home Trust1922	KMP Designs744		
Flextech Industries503		Honeywell107	Kool-Air Refrigeration.....1918,1920		
Flir Systems312		Honeywell Limited1845	L		
Flocor1910		HPAC-HEATING PLUMBING AIR CONDITIONING MAGAZINE N19/N20	L.M. Temperature Control .1541,1543		
Forbest Products Co.6		HRAI-Heating, Refrigeration and Air Conditioning Institute Of CanadaN15-N18	Lambro Venting Products305,307		
Foremost International/Contrac.....1937,1939			Legend941,943		
Form Solutions1245					



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Exhibitor	Booth	Exhibitor	Booth	Exhibitor	Booth
Lennox Industries	339	National Energy/Trane	1131	PowerMate/LP International	510
Lenox/hilmor	1136,1138	Navien	225	Primex	2530,2532
Leonard Valve Co.	812	NCI Canada	1321	Pro Kontrol	1413,1415
Liberty Pumps	622-626	Newgen Sales/Wheeler-Rex	2013		
Lochinvar	424,426	Newmac	1831-1835	Q	
Lucas-Milhaupt Toronto	1110	Nexstar Network	2411,2510	Quatrosense Environmental	1816
LynCar	1824,1826	Niagara and Halton Skilled Trades Academies	935	Quote Soft	821
		Noflo	1019		
M		Nootka Marine Adventures	2616	R	
M&G DuraVent	435-439	Noritz America Corp.	525,527	R.W. Beckett Canada	937
M.A. Stewart & Sons	1041	Northwest Mfg/WoodMaster	2041	Ratech Electronics	1815
Mack Constructions	1036	NTI	625	RBI-HPG Sales	734,736
Madok Manufacturing Limited	1930,1932	N-Two Cryogenic	4	Recochem	721
Mag Tool	205-209	Nu-Air Ventilation Systems	1219	Rectorseal	930,932
Mainline/Armco	2016	Nu-Calgon	1814	Redmond/Williams Distributing	1631
Malco	1518	NV ECO Vision Sales	1440,1442	Reed Manufacturing Company	2022-2026
Marathon International	1018,1020			Refco Manufacturing (US)	837
Maritime Geothermal	919,921	O		RefPlus	1906,1908
Masco Canada Limited	1837-1841	Oatey Canada	838	Refrigerant Services	1808,1810
Master Plumber	1837	O'Dell Associates	1840,1842	Rehau	1341,1343
Maxxon Corp.	1118	Oetiker	717	Reliance Worldwide Corp. (Canada)	831,833
MB HVAC Benefits	1535	Ontario College Of Trades	233	RespicAire	1045
Mechanical Business	N22,N23	Ontario Geothermal Association (OGA)	8	Reversomatic	531,533
Mechanical Contractors Association Toronto (MCAT)	936	Ontario Plumbing Inspectors Association	N9	ReviewBuzz	2508
MEP Drives	931,933	Ontario Refrigeration & Air Conditioning Contractors Association (ORAC)	1123	Rheem Canada	2109
Mestek Machinery-ISM	1530	Ontario Society of Professional Engineers-OSPE	2631	Rhomar Water	241
MIFAB	818	Ontor Limited	918-926	Riello Canada	422
Milwaukee Electric Tool	2125	Ortech Industries	1741,1743	Rinnai Corporation	317,319
Mits Airconditioning	2223-2227	OS & B	909,911	Riobel	314,316
Mitsubishi Electric Sales Canada	2231			Robertshaw	840,842
Miura Canada Co.	735	P		Rosenberg Fans Canada	1919,1921
Modine	2116,2118	Panasonic Canada	2106	Roth Industries	325,327
Moen	1830,1832	Pentair	539	RSES Canada-Refrigeration Service Engineers Society	N10
Morden National	2617,2618	Pentair Canada	634,636		
Morris Lee	2037,2039	Peppertree Air Solutions	1537,1539	S	
Multi HVAC	2112,2114	Petley-Hare Limited Insurance Brokers	1819	S.M. Trading House	1122
Multi-Flex	1514	Pfister Canada	2343	Sanuvox Technologies	530,532
Multi-Glass Insulation	338	Pipe Tools Supply	2309	Sauermann	1512
		Plumbing & HVAC	N11,N12	Schier Products	635
N		Polyform Cellular Plastics	711	Service Roundtable	1621
NAD Klima	1744			ServiceTitan	2409
Napoleon/Continental HVAC	2131			Seton	1934
National Energy Equipment	1135,1137			Shop Data Systems	235,237
				ShuBee	5

Exhibitor	Booth	Exhibitor	Booth	Exhibitor	Booth
Sinus North America Mfg. ...	613/615	Sporlan Division		Technical Translation Services	835
SJE-Rhombus	2633	Parker Hannifin	1825	Tempco Heating & Sheet Metal/ Navsat.....	521,523
Slant/Fin/Ltee	1242/1244	Square M Systems	320	Test Products	
Smart Home Financial Corp.	2613	Stelpro	2431,2433	International.....	820
Snap Home Finance.....	1723	Stevenson & Hunt		Testo	406
Snapin Controls.....	719	Insurance Brokers.....	536	The Mee Group.....	304
Snowdon HVAC	1236	Sumner Manufacturing		The Rideau Group.....	441,445
Solaira Heating Technologies-Inforesight Consumer Products.....	2519	(Canada)	1725,1727	The Whalen Company	501
Solar Ontario.....	344	Sunpump Solar	306	Thermaflex	1114,1116
Solar Pumps Canada.....	344	Supco	330	Thermal Hydronic Supply.....	431,433
Solar PV Heat.....	344	Superior Radiant Products	1320	Thermo 2000	618,620
Soler & Palau		Switch the Stat.....	2521	Thermo Mfg.....	737
(OEM Products Div.)	1709,1711	Systemair.....	1437	Thermolec	1421
Space-Ray Infrared Heaters	203			Trac Pipe Counter Strike	535
Spartan Peripheral Devices.....	1017			Trackem	318
Spectronics Corp.....	918-926	Taco Canada	311	Tract Systems	534
SpeedClean.....	2322	Tandem Chillers	1140,1144	Trimble.....	1540
Spirotherm	918-926	Taylor Pipe Supports.....	815	TUV SUD	2511
		TB Concept	2437,2439		



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°STELPRO is a family-owned business established in Quebec, Canada for 35 years, renowned in the electric heating industry, heating cables, ventilation (HVAC) and electronic controls. North American leader in its market, °STELPRO offers quality heating products designed and manufactured in Canada providing maximum performance, safety and innovative design.

°STELPRO employs more than 500 people in two manufacturing plants located in Saint-Bruno-de-Montarville and Grand-Mere, Quebec, where over 800,000 heating units are produced yearly (electric baseboards, convectors, fan heaters, heating cables, etc.) and approximately 400,000 electronic controls, including electronic thermostats, meeting the highest performance standards in the industry.

Thanks to innovation, know-how and thoroughness, °STELPRO has become a leader in the electrical heating market with products like the B series baseboard; the most renowned and trusted baseboard on the North American market today. Convector series like the SHC and Silhouette are also top of the class in their category, providing users with optimal comfort, modern design and a wide range of models.

www.stelpro.com/en-CA/heating

In the last few years, °STELPRO has once again led the competition with innovative new products like the Spider ceiling fan heater, specifically designed for residential garages, the Radiance cove heater and high-end baseboards like the Bella and the all-new Alux series. www.stelpro.com/en-CA/heating

The latest innovation from °STELPRO is the KI thermostat for the smart home. It is the first line-voltage Z-Wave thermostat to emerge on to the North American market. The KI is entirely designed and manufactured in Canada.

www.stelpro.com/en-CA/thermostats/electronic-smart-home

With a complete line of HVAC products, from duct heaters to electric furnaces, hand dryers to bath fans, °STELPRO offers the same unrivalled quality experts have come to expect from the °STELPRO name.

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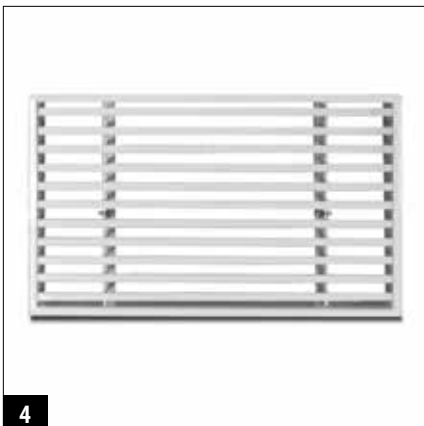
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1 The portable camera system from Hathorn Corporation is small and lightweight. Standard features include a 7.4-inch daylight readable monitor, Wi-Fi video transfer to any mobile device, 125 feet of push rod, text writer and footage counter. It also features a 512Hz Sonde transmitter, a rechargeable battery pack and adjustable lighting.

www.hathorncorp.com

4 The Dablrn bar linear, removable core grilles from DRG have a no flange frame offering a built-in look. They have a fully extruded aluminum construction and fixed blades designed for long straight airflow. The grilles, which are available in custom sizes, feature a durable powder coat finish and a removable core that is held in place with clips.

www.dayus.com

2 Belimo ZoneTight zone valves are designed to work in small spaces. The QVC zone valves are suited for commercial buildings where higher close-off and the ability to change flow is desired. The self-cleaning ball valve technology resists clogs. The PIQCV zone valve combines a differential pressure regulator with a two-way control valve to supply a specific flow for each degree of ball opening.

www.belimo.us

5 Aquatherm Blue Pipe is a polypropylene-random (PP-R) piping system designed for hydronic, chilled water, condensing water and industrial applications. It is sized from ½-inch to 24-inches and can withstand operating temperatures of up to 180F at 100psi. It is rust-proof and scale resistant.

www.aquatherm.com

3 The Woodford Model 19 freezeless, anti-burst residential wall faucet features a pressure relief valve. It has a stainless steel seat, standard O size seat washer and EPDM packing to prevent leaking.

www.woodfordmfg.com

6 VYKON Niagara R4 software framework for building automation and security from Canada Controls Inc. has advanced visualization with search, security and navigation tools. Programming is done with tag integration. The on-board real time clock requires no battery. The R4 framework operates with the JACE 8000 controller including two Ethernet 100MB and wireless communication. The system has drivers available to work with existing BAS systems and is compatible with previous AX and R2 framework applications.

www.canadacontrols.com



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1 The ultra-high efficiency oil-forced air furnace from Adams Manufacturing Company is available in various models including upflow, counterflow, lowboy and horizontal. It is suited to utility room, closet, basement and attic applications. All models (HEO Series) can be vertically or horizontally vented with three-inch PVC pipe. Features include a stainless steel heat exchanger with a moulded pro-ceramic combustion chamber. www.adamsmanufacturing.com

4 The Caddy Pyramid rooftop support system from Erico supports electrical and mechanical applications on a variety of roof surfaces. They are surface mounted and offer a high load capacity to help reduce installation time. The system is designed to prevent uneven load distribution. www.erico.com

2 The Medi-Flo3 from Franke is a hand hygiene sink suited to hospitals and medical centres. The wheelchair accessible sink offers a Laminar ozone disinfectant chamber to keep it free from bacteria and pathogens. It features a hygienic design that prevents water pooling and contains splashing. An infra-red sensor will automatically trigger waterflow after a pre-defined lathering time. www.franke-commercial.com

5 The MircoBlue condensate pump by BlueDiamond is a dual voltage 110V to 230V pump, which uses thermistor level sensing technology to remove the risk of stuck or sunken float switches. It has a flow rate of up to 1.3 gallons per hour, 16-foot head and six-foot suction lift. It can be mounted in any orientation. www.aspencaada.com

3 The Alizé from Dettson is an outdoor variable speed heat-pump unit that compliments and works with the Chinook gas furnace. It has a small footprint and is designed for silent operation. It offers a variable speed compressor modulating from 25 per cent to 100 per cent, and long operation cycles for improved air mixing. www.dettson.com

6 Appion's AV760 vacuum gauge has NIST-traceable certification and a full range of measurement from atmosphere to one micron. It reveals extreme leak points and displays six different units of measurement. It features a free ION HVAC/R app that enables remote viewing on a smartphone or tablet and has a rubberized, water resistant housing. www.appiontools.com

continued on 130

**Mr. Slim P-Series “THE -40°C UNIT”:
Market Leader in Ductless
Low-Ambient Cooling**

Server room climates demand cooling mechanisms designed specifically to meet their unique needs. That is why it is imperative to install a commercial-grade server room cooling system that is durable, efficient and reliable. That’s the P-Series Precision Cooling System from Mitsubishi Electric.

Commercial vs. Residential Grade Technology

Some modified residential units claim to be sufficient for server room applications. However, these units, designed for comfort cooling in residential applications, are not equipped to endure the strain placed on them by the continuous sensible heat load of server rooms. This could result in potentially reduced lifespan, higher servicing costs and, ultimately, expensive early system failure.

P-Series is a commercial-grade precision cooling system that can withstand around-the-clock usage and extreme conditions. It is equipped with a commercial-grade variable speed compressor designed specifically for durability and to maintain consistent, reliable server room temperature.

Precision Cooling vs. Comfort Cooling

Residential grade systems, though modified, are primarily designed to dehumidify for human comforts, otherwise known as comfort cooling. As a result, only 60 – 70% of their operation is dedicated to lowering sensible temperature. Server rooms, on the other hand, generate dry heat, meaning there is less need for humidity removal. P-Series precision cooling system is designed for removal of sensible heat, first and foremost. As a result, it is capable of effectively removing the vast amount of sensible heat load in a server room, which is equivalent to 80 – 90% of the total cooling requirement.

Seasonal vs. Constant Cooling

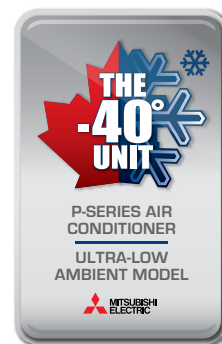
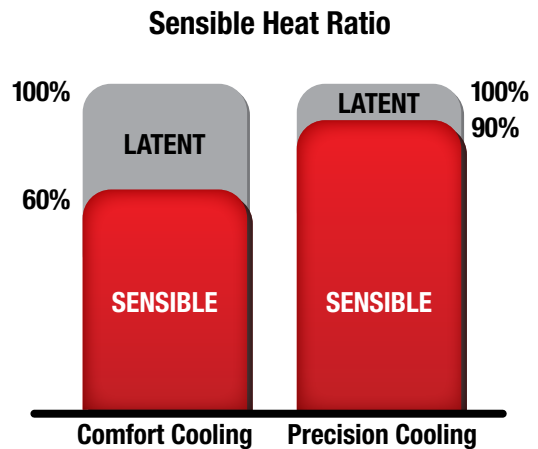
Compressors in residential units are not designed to deliver cooling in Canadian winters. Running them continuously during extreme cold conditions can lead to excessively low condensing pressure, which can result in a series of malfunctions and potential compressor failure.

P-Series and its Ultra Low Ambient cooling operation are specifically designed for 24/7 cooling in the Canadian climate, so they continue to operate efficiently and effectively even when outside temperatures reach as low as -40°C.

P-Series “THE -40° UNIT”

Mitsubishi Electric has an immaculate track record of cooling server rooms in temperatures as low as -40° for over 25 years. P-Series are installed in most of Canada’s coldest climates and have been operating in extreme conditions. There are units that have been in continuous cooling operation in Canada for over two decades – that’s 175,000 running hours and still counting!

So when the temperature plummets, you can trust your servers to P-Series “THE -40° UNIT” from the leader in ultra-low ambient technology, Mitsubishi Electric.





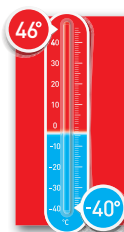
SERVER ROOM OVERHEATING?

Protecting important data depends on maintaining a controlled environment. That's why it is essential to install a commercial-grade server room cooling system that is consistent, efficient and reliable, 24 hours a day, 7 days a week.

With so much on the line, it's surprising that there are modified residential units claiming to be sufficient for server room applications. Little wonder that these units can't take the strain placed on them by modern server rooms.

Mitsubishi Electric's P-Series precision cooling system is different. It's a commercial grade ductless unit that is designed for commercial applications and is tooled specifically for durability and to maintain consistent, reliable server room temperature.

So whether you're expanding your server room or designing a new one from the ground up, Mitsubishi Electric P-Series can help keep your critical systems up and running 24/7. **Now that's a cool idea!**



BUILT FOR CANADA

As part of our commitment to the Canadian market, Mitsubishi Electric's **Ultra Low Ambient System** is designed to withstand extreme weather conditions, whether the outdoor temperature is +46°C or -40°C.





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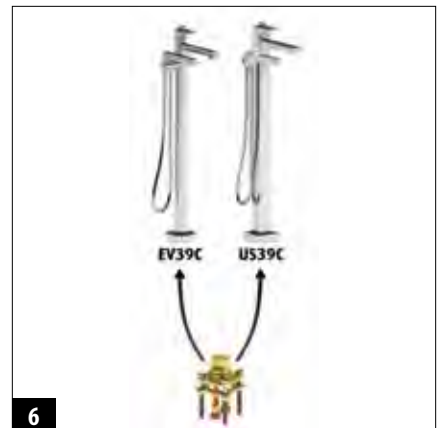
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1 ACO Drain systems consist of manufactured modular trench channel units made from either corrosion resistant polymer concrete – UL listed, or fiberglass with grates from a variety of materials for loading applications. Drain systems are available in two-, three-, eight- and 12-inch internal widths, and come with up to 130 feet of built-in continuous slope. www.acodrains.us

4 The horizontal condenser CMA series from Comfort-Aire is suited to fit in tight spaces. The condenser is AHRI matched to heat controller coils and can be used with Comfort-Aire's modular blower. It features a galvanized steel cabinet and is designed to operate quietly. There are four models ranging from 18 000 to 36 000 Btuh. www.comfort-air.com

2 Bosch Thermotechnology Corp. now offers the Buderus SSB Series, stainless steel boiler line with condensing technology. The line consists of eight models in four separate cabinet sizes, with inputs ranging from 85MBH to 1024MBH. These boilers can be cascaded and feature a proprietary ASME SA-240 stainless steel type 316L heat exchanger and an integrated pre-mix burner. They also feature a factory installed low-water cut-off and safety temperature limiter with a manual reset. www.boschheatingandcooling.com

5 Contrac's Clark wall hung elongated flushometer bowl meets ADA accessibility standards. The Clark is made of vitreous china and is LEED compliant. It has a 4.8 Lpf bowl and siphon jet action. www.contrac.ca

3 Caleffi's 535HA series pressure-reducing valves are suited to residential and commercial applications. They feature a dial indicator with direct readout, which allows for easy pressure pre-adjustment. After installation, the system pressure will automatically adjust itself to the set value. The valve is constructed of DZR low-lead brass and incorporates a noise-reducing and high flow seat design. The valve is certified to ASSE 1003, NSF 61, CSA B356 and NSF 372. www.caleffi.com

6 Riobel freestanding bath faucets come with a separate rough and trim. Contractors can install the rough, and have the trim delivered when it is ready to be installed. The universal rough is available in three connection types: NPT, PEX and Expansion PEX. www.riobel.ca



1 Em-Pro's HVAC dual side drive plasma table from Empire Machinery and Tools Ltd. offers a five-foot by 10-foot cutting area, and a 1000 ipm rapid traverse speed and positional accuracy of 0.0005-inches. The Model 510 comes standard with the Shop Data Quick Duct Cam software, as well as Hypertherm Power Max 45 Plasma, computer and controls software, and a duct package to connect to the user's exhaust system. The table is delivered assembled for easy installation. www.empire-machinery.com

4 The HL2 Series from Brant Radiant is a two-stage infrared tube heater that offers a Btu range of 65 000 to 200 000 Btu/h. It features tool-free access to hot surface ignition, and has a separated air and gas burner chamber and single or dual vent option through the sidewall or roof. www.brantradiant.com



2 Calefactio has added a three-way valve to its GMP6 and GMP18 glycol feeders. With a hose, users can direct the pump intake to the independent solution tank. When finished, the valve turns so that the pump suctions the GMP into the system. A reusable filling kit that contains a six-foot hose and strainer is sold separately. This kit allows users to pump directly from an independent solution tank into the system. www.calefactio.com

5 Heat-Sheet radiant floor tubing from Form Solutions is compact in size and made of preformed nodules that resist breakage. The tubing walks into place, and features a low profile design to protect piping during installation. It accepts 1/2-, 5/8- and 3/4-inch tubing and can be used in retrofit and new construction. www.heat-sheet.com



3 TurboTorch has introduced the G-Series single nitrogen purging regulator. It features a patented, high-strength alloy bonnet combined with a steel gauge guard to provide durability. The colour-coded knob prevents confusion, while the knob's ergonomic shape makes it easier to set pressure. The G-Series provides up to 500 psi delivery. www.victortechnologies.com

6 Little Giant's EC-1-DV series mini condensate removal pump from Franklin Electric Co., Inc. provides multi-voltage operation from one unit. It is designed to operate on common residential and commercial voltages of 115V, 208V and 230V single phase. The EC-1-DV features a vibration dampening design made up of an elastomeric cushion that supports the motor while reducing noise. www.littlegiant.com

continued on 132



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1 The Electric Eel Ecam ACE 2 pipeline inspection camera system from IPS is compact and durable. The ACE 2 features one-touch USB recording, an onscreen footage counter, a wheel kit for transportation and a heavy-duty screen cover. It has a stainless steel housed 1.68-inch diameter colour camera with sapphire lens, a 20 LED light ring and high resolution CCD element, 200-feet of Kevlar braided ½-inch diameter push rod, and an industry standard 512Hz Sonde. www.electriceel.com

4 Reed Solutions Kits include a Quick Release tubing cutter and two DEB deburr/chamfer tools for plastic pipe all contained in a sturdy plastic case. The tubing cutter produces a square cut so the pipe bottoms out in the fitting. www.reedmfgco.com

2 The CC-200 CoilPro from Goodway is a two-in-one electric sprayer. It has a built-in wet/dry vacuum that can be used to vacuum debris from coils and condensate pans. A 200 PSI pump delivers a spray at 0.9 GPM to wash coils clean. It offers an on-board eight-gallon water supply tank for portable use, or a hose may be attached to a water source. www.goodway.com

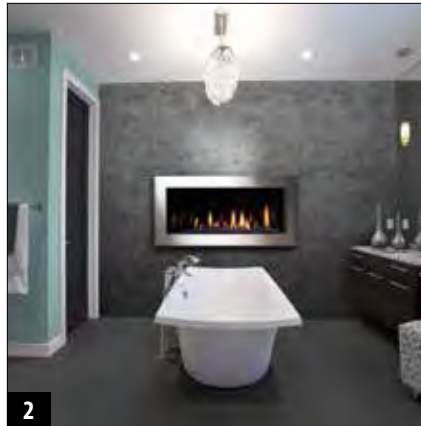
5 The DEMD-611LF thermostatic electronic faucet from Delta offers hands-free on/off activation. It features a mixing handle to adjust temperature when desired, a chrome finish and a 15 second maximum run time. It has an integrated thermostatic mixing valve and infrared sensor and is suited to ASSE 1070 applications requiring point-of-use temperature protection. www.deltafaucet.ca

3 The DSF destratification fan from Continental Fan has been designed to reduce hot and cold spots through the mixing of air in large spaces. The fans are suited to buildings with a ceiling of 15 feet or higher. DSF fans are available in 10-, 12- and 14-inch sizes. They feature a permanently lubricated ball bearing, an automatic reset thermal overload protection and a steel housing with corrosion resistant finish. www.continentalfan.com

6 The Gobi under mount condensate pump from Refco Manufacturing has an electronic energy control system. It features dual voltage and works with 110V or 230V. It can be installed on either the left or right side of a mini split and is UL approved. www.refcoswiss.com



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1 AquaRise maintenance couplings from IPEX are suited to repairs of AquaRise pipe. The mechanical joint end connections and rubber-lined stainless steel construction provides a pipe-to-pipe alternative connection. They are available in sizes one- through four-inches. The couplings are listed to NSF 61 for potable water and feature a Teflon coated EPDM gasket.

www.ipexinc.com

4 Malco TurboShear attachments feature a redesigned clamp, which allows the working head to rotate 360 degrees. The rotating head can be locked in any position to ensure that the drill or impact driver powering the head does not interfere with the workpiece. The telescoping clamp extends or shortens to fit any size drill or impact driver. www.malcotools.com

2 The Kingsman ZRB46 gas fireplace from National Energy Equipment fireplace has a width of 46 1/2-inches, a height of 43 1/2-inches, and a depth of 17 7/8-inches. It is approved for mobile homes, bedrooms and sitting rooms and has a hi/low millivolt or IPI valve system, which will operate during power failures. Optional features include a wall mount thermostat, a remote control and a child safety screen. www.neefireplaces.ca

5 Grundfos Hydro Multi-B pressure booster system is suited to apartment, large home and multi-story building applications. The CME pump combined with an MLE motor provides variable speed functionality and energy efficiency. It features quiet operation and connects to most BMS systems. www.ca.grundfos.com

3 The Amvic insulated panel for radiant heating is available in both residential and commercial styles. The residential panel is made using Type II (1.5 lb. m3 density) with R values of R10, R12 and R14. The commercial panel is manufactured using Type IX (2.0 lb. m3 density) with R-Values of R11, R13 and R15. The oversized, four sided tongue and groove interlock system makes for a secure installation. www.amvicystems.com

6 Islandaire has re-designed its vertical thru-the-wall air conditioner and heat pump units (VTACS and VTHPs) to create the EZ Series VP and VR. The series is suited to construction projects, and is available in 9 000, 12 000, 15 000 and 18 000 Btuh cooling sizes with either a heat pump or electric heat. www.islandaire.com

continued on 138

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Lochinvar is introducing a new line of floor-standing KNIGHT® Fire Tube Residential Boilers. The advanced KHN KNIGHT Boiler features a stainless steel fire-tube heat exchanger and offers AFUE of 95 percent across all models, which range from 55,000 to 285,000 Btu/hr. With up to 10:1 turndown, the firing rate modulates based on demand to eliminate on/off cycling and optimize efficiency and heating comfort.

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In addition, the new KNIGHT Boiler's footprint, as well as the placement of connections and vents, is strategically designed to easily allow for drop-in replacement of old, inefficient boilers.

"We designed the KHN KNIGHT Boiler to deliver high-efficiency and advanced technology for a wide range of applications, including energy retrofit installations where cast iron boilers were previously installed," said Dan Rettig, product manager. "The new KHN models, which are significantly lighter and more compact than cast iron boilers, streamline the replacement process by simplifying connections and reducing the need for re-piping."

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REDUCE INSTALL TIME

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UP TO **10:1 TURNDOWN**



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THE HARDEST PART IS
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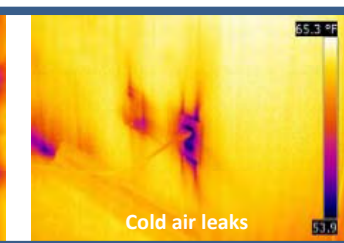
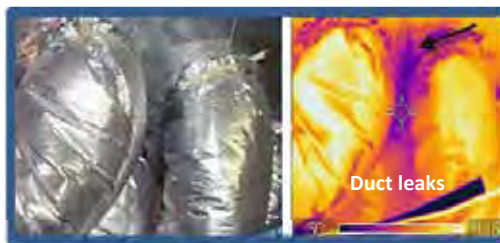
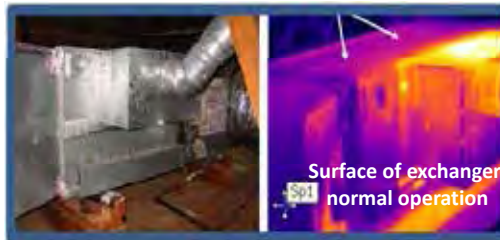


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HVAC Applications examples for FLIR Thermal Cameras



HVAC Applications examples for FLIR Thermal Cameras

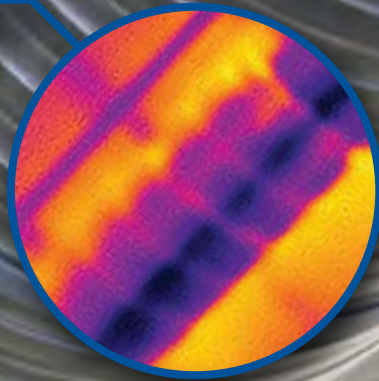


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1 The Nordic ATW Series air-to-water heat pump from Maritime Geothermal Ltd. may be used with an in-floor heating system. It also cools water for air conditioning, and is available in sizes up to 6.5 nominal tons. The outdoor portion of the Nordic ATW Series features defrost logic and is equipped with Nordic's ice channelling technology to prevent ice build-up. The indoor unit features an electronic control board with digital user interface, BACnet capability and on-board aquastat functionality. www.nordicghp.com

4 The Lil' Max seven- to 50-GPM HDPE plastic grease interceptor from Mifab may be installed on the ground, semi recessed or flush with the floor. It features a removable baffle assembly, deep seal trap, a sewer gas stopper and internal air relief bypass. www.mifab.com

2 The Serenity and Symphony shower drain system from OS&B are available in a four-inch by four-inch square or four-inch round top. They feature solid brass construction and a removable grate for cleaning. Bases are available in ABS, PVC, brass or cast iron in straight or side discharge configurations. www.osb.ca

5 Taco Viridian ECM VR1816 for residential applications features infinitely variable fixed speed or six pressure presets, while its VT2218 Delta-T variable speed temperature sensing circulator reduces fuel costs. The VR3452 has an extended operating range and is suited to chilled and hot water applications and features an optional communications module. The VR15 to VR30 models feature built-in, web-enabled options. www.taco-hvac.com

3 The Setra MicroCal automated calibrator from Alpha Controls and Instrumentation, is used as a stand-alone calibration standard for differential and gauge pressure sensors. It combines precise pressure control with high accuracy modular pressure reference. Features include up to eight hours of battery life, built-in leak test function and low range dual reference pressure sensors with NIST traceability. www.alphacontrols.com

6 The Oetiker PEX stainless steel Stepless ear clamps 167 are pre-set and grip the tube for easy installation. One installation tool is required for all clamp sizes. They feature a 360 degree seal and PEXGrip technology, and come in 1/2-inch and 3/4-inch PEX tube sizes. The clamps comply with ASTM F877/F2098 standards. www.oetiker.com



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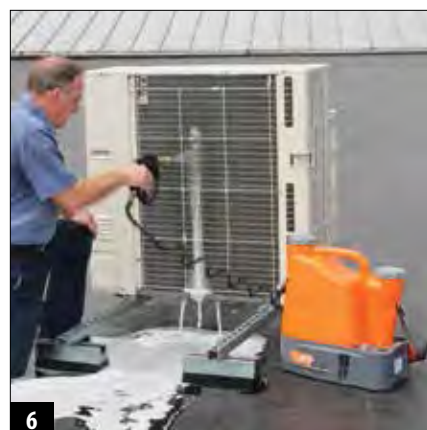
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1 The ComPac I and ComPac II air conditioners by Marvair are wall mounted conditioners for cooling telecommunications shelters and enclosures. There are three model lines of the ComPac that include the HVEA line, the AVPA line and the AVPC line. The ComPac II features a factory-installed economizer, which uses outside air to cool the telecommunications equipment. www.marvair.com

4 Maverick Benefits (MB) HVAC provides health, dental and disability coverage for employees and administrative staff of HVAC companies, as well as the owners. MB helps HVAC companies create affordable, union-comparable benefit plans, which are suited to either non-unionized shops or the non-unionized staff of union shops. www.maverickbenefits.vpweb.ca

2 Great Basin grease interceptors from Schier Products are rotationally moulded $\frac{3}{8}$ -inch thick, high density polyethylene (HDPE) interceptors with a uniform wall thickness. Features include a TeleGlide fully-adjustable riser system, a built in triple outlet, a tie down point for anchor kit and moulded-in lift handles. They can be installed indoors or outdoors. www.schierproducts.com

5 Setmark Snap-Around pipe markers from Seton are pre-coiled markers that snap into place. They are suited to dirty, oily, greasy or rough surfaces and work both on indoor and outdoor pipes. Arrows are included on every marker to indicate flow direction, and they are printed with UV ink for fade resistance. Stock brass valve tags are stamped with stock legends, and withstand temperatures up to 1200F. www.seton.ca

3 The SV601 series six port control ball valve from Spartan Peripheral Devices is a combination valve body casting for connecting heating and cooling four pipe systems into a single coil. The valve body design allows for a leak-free separation from a heating and cooling system and prevents mixture of return flow. Modulating or floating actuators can be used to control this series. www.spartan-pd.com

6 The CoilJet from SpeedClean is a portable AC coil cleaning system, which works on the inside and outside of HVAC coils. It produces 125 psi of coil washing power at 0.6 gpm water flow. It features a deep cycle, a 12V rechargeable battery, separate on-board water and cleaner tanks, and an optional spray wand with a 90 degree nozzle. www.speedclean.com

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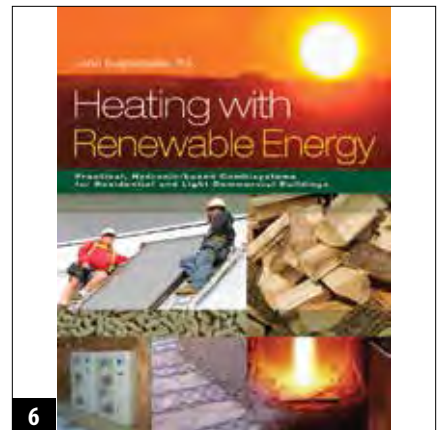
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1 The S-line ultra quiet inline mix flow duct fan from Atmosphere, offers a motor that is speed controllable and has permanently lubricated ball bearings and thermal overload protection. It features a double insulated wall to prevent condensation and reduce noise levels. The rubber duct connection gasket is designed to ensure an airtight connection. The integrated backdraft damper prevents air leakage when the extractor is not operating. www.atmosphere.com

4 The Universal NuFit corrosion resistant bathtub drain cover from Watco Manufacturing is available in nine finishes and features a high flow grid strainer to prevent hair clogs. It is available with foot actuation (toe touch) and push pull stoppers. www.universalnufit.com

2 Pro-Connect, Webstone's line of solder-less solutions, offers an array of press products including ball valves, separators and thermostatic mixing valves. Products exclusive to Webstone include the Isolator E-X-P, Isolator rotating flange, Isolator with multi-function drain, ball drain and hydro-core manifold system. They are available with connections compatible with press tools. www.webstonevalves.com

5 The Ion+ Digital Level Control with high water alarm from Ion Technologies provides alarm notifications through an audible buzzer, LED indicators and dry alarm contact. The device can be connected to external alarm notification systems such as the Ion Gateway or MetroMail systems. It starts and stops the pump via the piggyback pump power receptacle. www.ionproducts.net

3 The System Solution for Saturated Steam from Victaulic, is a grooved piping system for commercial and industrial steam applications. It is available in two to eight inch sizes and features the Style 870 rigid coupling and a full line of fittings. It also has an OGS-200 groove profile. The system's components are designed in accordance with ASME B31.1, ASME B31.3 and ASME B31.9 codes. www.victaulicsteam.com

6 Heating with Renewable Energy by John Siegenthaler, P.E. is an 850-page full colour text. It shows readers how to design and construct practical systems that supply space heating and domestic hot water using renewable energy heat sources such as solar thermal collectors, heat pumps, and wood-fired boilers. www.hydronicpros.com



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1 Eaton's 4Dimensional strut system has a modular design and is compatible with most traditional fittings and accessories. Suited to new and retrofit applications, it has two-sided and four-sided functionality. The SH hole accepts 5/8-inch hardware and the system is lightweight. www.cooperindustries.com

4 The ThermalPro boiler stations with enhanced insulation units from Watts Radiant are pre-piped, insulated pumping stations for mechanical rooms. They are available in a variety of non-mixed and mixed configurations. The stations come with supply and return connections, check stop, isolation valves, a pressure bypass, circulator and in the mixed option a 24V three way floating point mixing valve, all encased in a multi-piece foam case. www.wattsradiant.com

2 The Wilo Stratos GIGA high efficiency inline circulator has a maximum ambient temperature of 104F and maximum operating pressure of 232 psi. It has a maximum flow of 275 USgpm and a maximum head of 167 feet. Multiple control modules are available for the pump. It features cast iron construction with a high-temperature high-pressure engineered composite impeller and a stainless steel pump shaft. www.wilo-canada.com

5 Series 750 low temperature tube heater from Superior Radiant Products maintains tube temperatures of less than 750F while providing even heat distribution. The Series 750 configurations include Model LA single-stage or Model LTX two-stage burners with a specialty tube pack system. www.superiorradiant.com

3 The iManifold digital gauge from Imperial is compatible with iPhone 4S and higher, iPad 3 and higher, and Android 4.1 and higher. The system features wired and wireless probe options and Bluetooth connection. It comes with a free iManifold App, which provides connections to services through geolocation, weather data and the AHRI database. www.imanifold.com

6 Boshart Industries offers valves for both plumbing and heating including ball valves, gate valves, mini ball valves, sediment faucets and wall hydrants, supply stop and other low pressure valves. The product line includes stainless steel, no lead brass, brass, chrome plated brass, 204 and 316 stainless steel, PVC and CPVC. Sizes and connections vary from threaded to solvent weld to push fit. www.boshart.com

continued on 144

New Little Giant® Speedi Duct™ Provides Protective Options For The Most Challenging Applications

The new Little Giant® Speedi Duct™ line set duct and accessories cover, protect and aesthetically hide refrigeration line sets for both mini-split and ducted air conditioner systems. Now available in the color white or ivory, Speedi Duct™ naturally blends in against structures of similar colors or can be painted to match any exterior color. Multiple sizes of straight duct along with accessories, such as elbows, bends, caps, and joints, provide a flexible solution around any problematic location or application.

Simple Installation

In addition to being flexible, Speedi Duct is easy to install. One of its primary features, the patented SpinFix™ clip and rail system, allows the contractor to quickly secure the line set, drain tubing and electrical wiring while the Speedi Duct covers are easily snapped on over the top.



Speedi Duct protects against two destructive inhibitors to air conditioner efficiency:

- First, it is UV resistant, making Speedi Duct resilient against sunlight exposure which can cause non-resistant materials and surfaces to fade, crack or discolour.
- Second, a flush-fit outer design against the wall minimizes gaps that allow dust, dirt, insects and animals to enter and destroy line sets and drain hoses.

A variety of all-inclusive installation kits provide the installer with everything needed to quickly and properly meet the need of the application.

Flex Hose Kits

Flex Hose Kits are the only line set cover systems designed to completely cover the outdoor line set from the wall to the condenser line set valves, protecting the foam insulation from weather, accidental impact or insect damage. The unique design of the Flex Hose makes for quick and easy inline installations when the line set transitions around outside or inside corners of the building, connecting both sections of straight duct. The Flex Hose Kit is available in both 3" and 4" sizes and ivory or white colours.

For more information on Little Giant plumbing or HVAC products, visit www.littlegiant.com.

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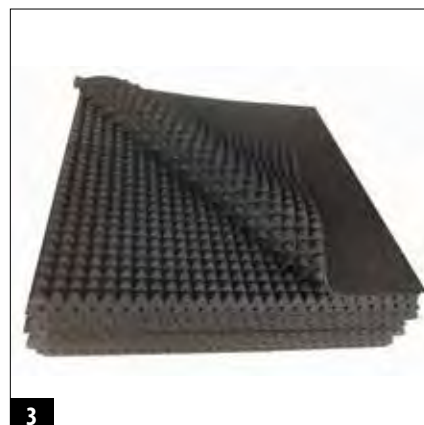
littlegiant.com



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1 The IKON apron front, single bowl sink from Blanco, is made of Silgranit, a natural granite composite material. The sink is available in three colours and is heat resistant up to 536F. The 30-inch apron front single bowl has a depth of 10-inches and resists scratches and stains.

www.blancoamerica.com

4 The Raupex Speed radiant overpour fastening system from REHAU can be installed in concrete slabs, suspended slab or thin slab overpour projects. The Raupex Speed O₂ barrier pipe with hook-and-loop wrap is walked on to the Raupex Speed mat without the use of specialized tools. The pipe can be detached and repositioned. The mat is offered in 3.1-foot-wide by 52.9-foot-long rolls.

www.na.rehau.com

2 The VHR200R-EC heat recovery ventilator with electronically commutated motors from Fantech is suited to residential applications with airflows ranging from 80 cfm to 200 cfm. It incorporates an internal recirculation defrost cycle, and also features an ECM motor with built-in integral electronic controls.

www.fantech.net

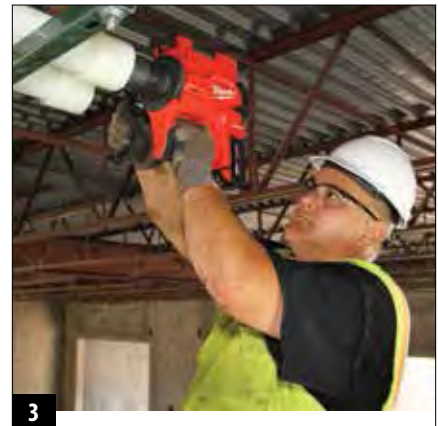
5 The Vitocrossal 300, CU3A from Viessmann is a compact, floor-standing stainless steel condensing boiler. It is suited to retrofits and cast-iron boiler replacements in residential and small commercial applications. It features a MatriX dome burner for natural gas or propane, a high temperature operation up to 194F and high water volume. www.viessmann.com

3 Iso-Pyramid vibration isolation pads from AcoustiGuard-Wilrep Ltd. are 25mm thick and available in one-metre by one-metre square sheets. Pads can be used in single or double layers beneath poured concrete slabs to create an acoustically isolated floating floor or housekeeping pad for mechanical equipment. The pads are self-adjusting to load and are made from 100 per cent recycled rubber crumb.

www.acoustiguard.com

6 Features of the KIGAZ 310 combustion gas analyzer from Kimo Canada include an interchangeable flue gas probe, CO dilution, auto-zeroing in the flue and a gas flow auto-setting. It features LED on the probe handle to light dark areas, a built in printer and three pressure sensors.

www.kimocanada.com



1 Ostberg's heat and energy recovery unit (HERU) removes polluted and moist air and recovers the used indoor heat (alternatively cooled air) from the exhaust airstream. It simultaneously provides the house with warm or cool filtered, clean air. HERU is available in four sizes from 3000 to 10 000 square feet. It can be mounted in a warm or cool space and is controlled with a wireless remote.

www.products.ostberg.com

4 The 2G Energy G-Box compact combined heat and power (CHP) co-generation module from G7 HVAC Inc. is suited to hotels and high-rise condominiums. Modular assembly allows for ease of installation. It runs on natural gas or bio-methane. The G-Box 20 also runs with liquid gas.

www.g7integratedhvacsystems.com

2 The TechnoForce e-HV by Bell & Gossett, a Xylem brand, is a pre-engineered pressure booster package. It is a compact, multi-pump, which features direct motor-mounted Hydrovar Multi-Master variable speed drive controllers. It also has individual thru-panel circuit breakers that provide accessibility without the need of a full station shutdown. It meets ASHRAE 90.1 energy requirements for pressure boosters.

www.bellgossett.com

5 The OdorMiser MTX from Respicaire uses UVGI with activated carbon absorption and photocatalytic oxidation. It is suited to ducted systems, and features a large active surface area, a smart light photo cell, a built-in tandem outlet, ozone free plus UVV option and more.

www.respicaire.com

3 Uponor PEX pipe and ProPEX ASTM F1960 expansion fittings are available in 2 ½-inch and three-inch sizes. The pipe offering includes Uponor AquaPEX for potable-plumbing applications and Wirsbo hPEX oxygen-barrier pipe for hydronic heating and cooling applications. It is available in various coil and straight lengths. The expansion fitting offering includes a line of tees, elbows, couplings and transition fittings.

www.uponor.ca

6 The Goodman DSXC16 high efficiency two-stage air conditioner operates in tandem with the company's Smartcoil five millimetre tube condensing coil. It features a quiet condenser fan system and is compatible with the ComfortNet Communication System. It has a touchscreen interface.

www.goodmanmfg.com

continued on 148



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1 Navien's NCB-E residential combi-boiler is capable of providing a house heating system while also providing the domestic hot water output of a stand-alone tankless water heater. Four models offer maximum inputs of 120 000 to 199 900 Btuh. NCB-150E, NCB-180E, NCB-210, NCB-240E. It features a Grundfos pump, a PRV connection and a quiet fan. www.us.navien.com

4 Zoeller Pump Company has announced the release of the Shark 12 fractional horsepower grinder series. This series is suited to residential and light commercial applications. The pump is made of cast iron, and offers performance head of up to 16.8-metres. They are available in automatic or non-automatic configurations. www.zoeller.com

2 Viega FostaPEX form-stable, multi-layered tubing is for plumbing and radiant heating applications. It pairs the flexibility of PEX and the stability of rigid piping, and has a low coefficient of expansion. Design temperatures and pressure ratings are 100 psi at 180F and 160 psi at 73F and 80 psi at 200F. www.viega.us

5 Greenskin building penetration and radon gas seals from Mainline Backflow Products Inc. are made from polyethylene. They are CCMC certified and feature a watertight/friction fit seal, which creates a moisture barrier. Dimples along the product keep it raised allowing for air-flow. Greenskin material is UV rated, non-conductive and non-corrosive, and does not require taping or caulking. www.greenskinseals.com

3 The ProLon VC2000 series zone controllers are designed for variable air volume zoning systems. Features include a built-in microprocessor, control of the Belimo actuator using Halomo technology, one digital output and one analog output, remote monitoring and configuration with ProLon Focus software. www.prolon.net

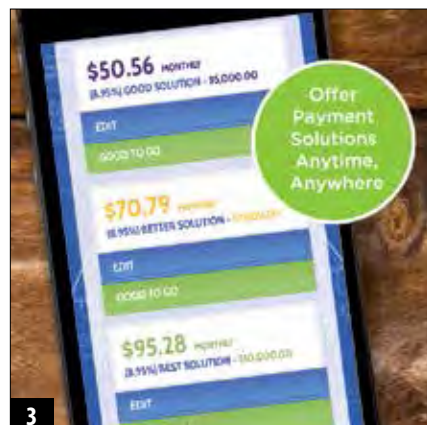
6 Peppertree Air Solutions Inc. offers a range of sheet metal products that combine the efficiency of the conical collar with a quadrant standoff to Peppertree's spin collar. All are made with beading to prevent duct slippage. Materials include G90 as the standard galvanized coating. Aluminum and stainless steel are also available. www.peppertreeairsolutions.com



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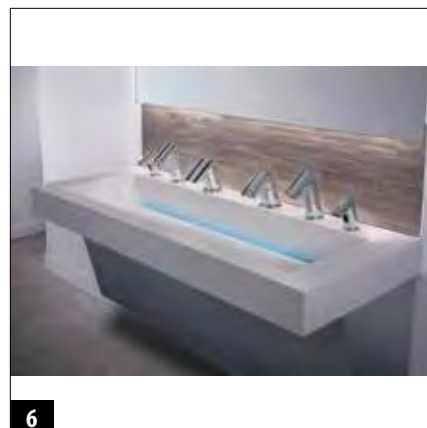
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1 The modulating electric furnace with electric controls SFE/SFECM Series from Stelpro has a built in temperature sensor and is available with a 120V motor. It features a reduced size (32 ½ inches h x 20 inches d x 22 ½ inches w) and updated electronic controls, including an eco mode. www.stelpro.com

2 The Paragon 8145-AV auto voltage defrost timer from Robertshaw is suited to commercial freezers and refrigerators. It offers reliable automatic defrost capability, and accommodates various types of defrost systems including electric defrost heaters, hot gas and compressor off cycle. www.robertshaw.com

3 Snap Home Finance offers financing for homeowners across Canada for a variety of home improvement products. This program helps to increase sales with more flexible financing options. Promotional programs can be tailored to contractors and customers, and the company offers flexible financial products as well. www.snapfinancial.com

4 Cyclone Mxi modulating commercial gas water heaters from A.O. Smith have 120 to 499 900 Btu/h input. Features include 60 to 199 gallon capacity, a modulating firing rate, which changes with demand and an LCD display. It is ENERGY STAR qualified with up to 98 per cent rated thermal efficiency. www.hotwatercanada.ca

5 The compact ECO Boiler from Weil-McLain Canada is available in 70, 110 and 155 MBH sizes. It is suited to retrofit installations and delivers up to 95.2 per cent AFUE. It features a stainless steel fire tube heat exchanger, an LCD display and multiple venting configurations. www.weil-mclain.ca

6 The AER-DEC integrated sink from Sloan is a soap dispenser, faucet, hand dryer and sink basin touch free system. The basin is customizable in terms of size, configuration, mounting and colour, and features three touch-free stations. The faucet uses active infrared technology and has an automatic shut off. www.sloanvalves.com

continued on 146



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1 The Slim Tech air-curtain line from Williams works to keep building environments free of airborne contaminants. It is ETL Listed and is available in 26-inch to 144-inch lengths. It has direct wall mount or threaded-rod installation options. It features a weatherproof powder-coated exterior cabinet and adjustable aluminum vanes.

www.williamscomfortprod.com



2

2 Tract Systems software allows businesses to move paper-based processes to a real-time, cloud-based application. Users can manage operations without switching between different systems. Features include scheduling, complete fieldwork, invoicing, inventory tracking and work order management. www.tractsystems.com



3

3 Fujitsu has introduced ductless mini split systems that offer up to 33 SEER. The 9000, 12 000 and 15 000 inverter wall mount systems are available as split system heat pumps designed for quiet operation. Features include wireless remote control, ion deodorizing filters, a sleep timer, a 24-hour timer and a four-way auto louvre.

www.fujitsu.com



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4 The Trueview M18 LED stand light from Milwaukee Tool is an area lighting solution that withstands industrial use. The 2130-20 assembles quickly and has a maximum extension of seven-feet high, and it collapses down to 40-inches. The light head can be extended from four- to seven-feet to light overhead work or minimize shadows when casting light downward. It provides 2000 lumens of high definition light in high mode, 1300 in medium and 850 in the lowest setting. It features reinforced legs and a stable base.

www.milwaukeetool.ca



6

5 Hebdraulique's compensator expansion joints allows for thermal expansion for rigid heating piping in institutional, commercial and industrial buildings. They can be installed vertically or horizontally. Compensators, or externally pressurized expansion joints, can replace controlled flexing and slip type expansion joints. www.hebdraulique.ca

6 The PHIX Cartridge from Zurn is a solution for neutralizing acidic wastewater. It is installed under the sink and is suited to applications such as school laboratories, healthcare facilities, maintenance and commercial rinse sinks. It features an under-sink point of use system that does not require special piping. www.zurn.com



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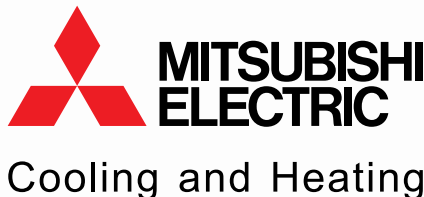
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Options for multiple boiler plants

Make your best choice—understand the pros and cons of common designs.

BY MIKE MILLER

One of the main goals when installing multiple boilers in an application is to increase operating efficiency by being able to more accurately match the boiler plant's output to the load of the building. Another resulting benefit includes gained redundancy. If one boiler is down for maintenance purposes, the remaining boiler(s) should still be able to maintain the building load for the majority of the heating season, since the overall plant is sized for the coldest day of the year.

While for the majority of the season, only a portion of the boiler(s) in a multiple boiler installation is needed, the addition of equal run-time rotation through implementation of a control system can further extend the life cycle of each of the boilers installed.

Since water takes the path of least resistance, the first boiler being the one closest to the primary pump would naturally see the highest flow, whereas the last boiler would see the least amount of flow. It is therefore important to install balancing or globe valves at each boiler so that the flow through each can be balanced to achieve equal flow. Equal flow will also impact the deltaT across the boiler and ensure the best operating efficiency.

The benefits of this piping arrangement include that it is conceivably the easiest to install, it is cost effective with the least amount of pipe used and all boilers see the same system return water temperature. The negative aspect of this piping arrangement is that the operating efficiency can be compromised if the flow is not properly balanced through each boiler. This piping also results in the biggest stand-by losses with water flowing through boilers that are sitting idle, incurring additional stand-by losses through the boilers chimney(s) and jackets.

The reverse return piping system also, shown in *Figure 2*, lends itself to high mass boilers. Here, each boiler's supply and return are piped into the supply and return of the common and main system/building loop in a fashion that ensures equal amounts of piping for each. The result is that the first boilers supply will end up being the last return going into the main building loop. Since the piping is equal length and the distance the water will be forced to travel through all boilers is equal, this piping method inherently

Figure 1 Direct return piping system

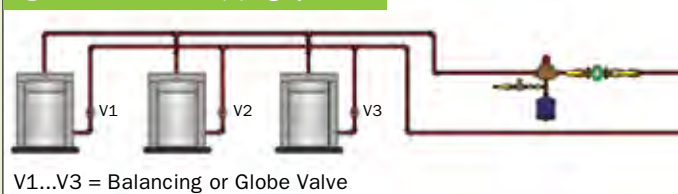
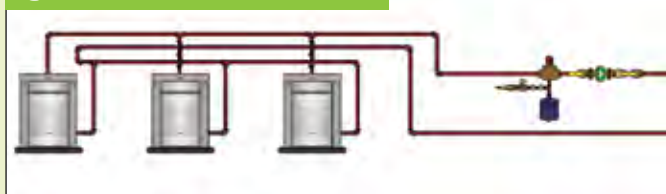


Figure 2 Reverse return



There are typically four different piping options you may see deployed in the field. Those options are commonly referred to as direct return, reverse return, primary/secondary and parallel primary/secondary. A review of the features and benefits of each will help you to determine the most appropriate choice depending on the circumstances.

The direct return piping system shown in *Figure 1* mainly lends itself to high mass boiler applications. The supply and return from each boiler are piped into the supply and return of the common and main system/building loop. All boilers being equal, without the means of balancing, the single primary loop pump would provide unbalanced flow through each boiler.

self-balances the flow through each of the boilers without the added cost and proper adjustment of balancing valves through each. Equal flow will impact the deltaT across the boiler and therefore ensure best operating efficiency.

While it utilizes more piping than that of direct return, the benefits of this piping arrangement include that it is still conceivably easy to install and all boilers see the same system return water temperature. This piping also results in bigger stand-by losses with water flowing through boilers that are sitting idle, incurring additional stand-by losses through the boilers chimney(s) and jackets that are unnecessary when compared to the remaining two piping options.

WORTH NOTING

The reverse return piping method originally caught on in Europe. It is named after Albert Tichelmann (1861–1926), a German engineer in the field of warm water heating. Tichelmann often deployed this installation method for radiator and baseboard installations, as well as solar collectors. In Germany, this piping method is still referred to as the Tichelmann System.

Before discussing primary/secondary systems, the only reason this particular boiler piping arrangement is included here is because you will see it occasionally in the field. While it is in many ways a favourite piping arrangement for heat distribution piping systems, it is in no way the piping arrangement of choice for me in near boiler piping systems. It has one very critical downfall that will be discussed below.

The primary/secondary piping arrangement lends itself to both, high and low mass boilers. It has all boilers connected separately to the primary loop through means of hydraulic separation. Hydraulic separation in this example can be achieved through engineered fittings or sets of closely spaced tees to eliminate the pumping in series of the boiler pump(s) and the primary pump. Closely spaced tees are shown in the piping example in *Figure 3*.

The benefits of this system include that it is easy to pipe boilers in this fashion. The installation of a dedicated boiler pump for each boiler ensures adequate flow through it at any time it is needed. It also allows the stand-by losses to be minimized in boilers that are not firing by not running the warm system water through boilers that are off, therefore eliminating losses through the boiler's jacket or chimney.

Most low mass and condensing boilers these days come with their own controls that integrate pre- and post-purging of the boilers with the use of the boiler's pumps. Some even control the speed of the pumps based on ΔT while the boiler is firing. Many boilers won't fire unless they have been through a pre-fire process using their own onboard controls.

The downfall of this particular installation method is that each boiler sees a different return water temperature that can greatly impact the efficiency of the boilers downstream,

WORTH NOTING

Primary/secondary isolation via closely spaced tees requires the tees to be as close together as physically possible, but never more than four times the primary piping diameter. Many engineered drawings show that distance to be 12 inches or one foot apart, which is only accurate if the primary piping is three inches in diameter.

Figure 3 Primary/secondary

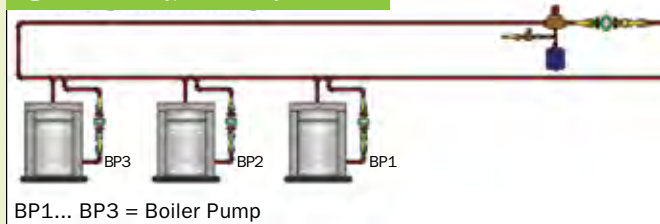
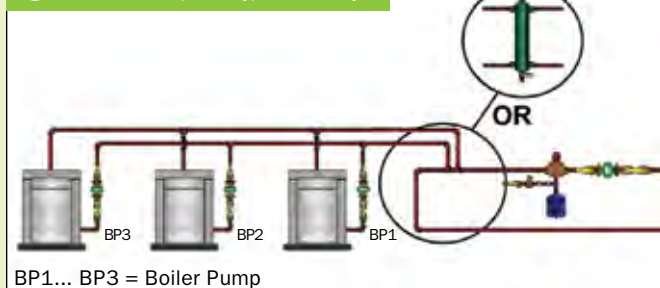


Figure 4 Parallel primary/secondary



especially if the system uses condensing boilers. To summarize again, while this piping method successfully hydraulically isolates each boiler from the primary loop, most condensing boiler applications would suffer from the inherent downfall of the cascading return water temperature.

Parallel primary/secondary is often the most effective and beneficial multiple boiler piping option. It combines the parallel piping for each boiler to ensure equal boiler return water temperature to each boiler, dedicated boiler pumping and then the integration into the primary or system loop via means of a common hydraulic separation. This again, eliminates the potential for pumping in series between the boiler pump(s) and the primary system or loop pump. Just as before, hydraulic separation can be achieved through specifically designed engineered fittings, or a set of closely spaced tees or a hydraulic separator as shown in *Figure 4*. Hydraulic separators are often designed to include features such as air and dirt elimination, which are a crucial addition to any closed loop heating system.

As is the case with the primary/secondary benefits stated above, this piping method also increases operating efficiency of the boilers, and minimizes stand-by losses through the boiler's chimney or jackets of the boilers that are not firing.

While any of these piping options can be deployed for various applications and for various reasons, the most dominant piping method I see in the field is the parallel primary/secondary. Overall, it provides optimal equipment performance, minimizes stand-by losses, and is the easiest to add boilers to down the road, if required.



Mike Miller is chair of the Canadian Hydronics Council (CHC) and director of sales, building services with Taco Canada Ltd. He can be reached at hydronicsmike@taco-hvac.com.

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CHANGES AT TACO FACILITATE DIVERSIFICATION

Taco, Inc. has completed a structural reorganization, which starts with a change of name. Taco, Inc. is now Taco Comfort Solutions, a Taco Group Company. According to a recent release, the changes have been made to allow the company to diversify and enter into new industries and market channels.

Under the privately-held company's new organizational structure, Taco Comfort Solutions is a part of the Taco Group. The Taco Group includes operations and sales offices in Canada, the U.S., Panama, Italy, Dubai, South Korea, China and Vietnam. Other worldwide elements of the Taco Group include Hydroflo Pumps/Fluid Solutions of Fairview, TN, Askoll/Taco Flow Solutions of Sandrigo, Italy and Taco Trading/Supply Chain Solutions Ltd. of Kowloon, Hong Kong.

The company also announced that the Taco Group has completed its acquisition of Italian pump manufacturer Askoll's indoor heating pump company. Now called Taco Italia SrL, the company uses the trade name Askoll/Taco Flow Solutions. Askoll's patented ECM technology has been employed in Taco's recently introduced 00e Series circulator line.

Taco Comfort Solutions is branching out into vertical markets and channels, both in HVAC and non-HVAC. This was illustrated by its development of smart plumbing products that conserve water and provide instant hot water. Its Hydroflo Pumps/Fluid Solutions company manufactures pumps used in irrigation and agriculture applications. www.tacocomfort.com

CIPH HOLDS FIRST BUSINESS MEETING OF 2016

Dane Jensen, CEO of Performance Coaching was the featured speaker at the The Canadian Institute of Plumbing and Heating (CIPH) Ontario Region Business Meeting on January 28, 2016 in Mississauga, ON. Siân Smith, senior director of strategic procurement, Noble Corporation, opened the meeting, which attracted 121 members, by presenting the Outstanding



Service Award to Peter Stojanov, Onward Sales and Marketing. Lifetime Service Awards were presented to Jim Teskey, Canplas; Eric Jenkins, Emco; Melvin Stadler, Emco; and Rex Blundell, Emco.

Eric Todd of Bardon Supplies was awarded The 50 Year Service Award and graciously thanked the industry, co-workers and his wife for the decades of support.

CIPH's third Business Meeting will be held on April 14, 2016 and will feature Rex Murphy, social commentator and editorialist, Distinct Canadian Voice. It will be held at the Mississauga Convention Centre in Mississauga, ON. www.ciph.com



Eric Todd of Bardon Supplies recipient of The 50 Year Service Award with his wife, Judy Todd (r), and CIPH chair, Siân Smith.

ON THE MOVE

Noble's Guelph branch has moved to a larger location, which opened in February of this year. The new address is 197 Hanlon Creek Blvd. Store hours are Monday to Friday, 6 a.m. to 5 p.m. www.noble.ca

TIMES ARE A'CHANGING AT AQUATHERM

Aquatherm North America made a number of announcements at the AHR show in January. The company has begun to rebrand and has incorporated a new logo and ad campaign, which was launched at AHR. Additionally, it has published a North American product-specific environmental product declaration (EPD) for polypropylene piping, which has been independently verified by NSF Sustainability. Aquatherm has also made some personnel changes. Megan Hernandez has been hired to marketing manager, and the company has promoted Dalton Clark



MARKHAM BASED COMPANIES ACQUIRED BY COMPONENT HARDWARE GROUP

Component Hardware Group, Inc. has acquired Specialty Food Service Hardware, Inc. and its related sister company, Vision Parts & Accessories Inc. The Markham based companies are suppliers of components and parts to the commercial foodservice and wholesale plumbing markets throughout Canada. Under the terms of the acquisition the companies will continue to service all current customers, and also provide coverage

for Component Hardware Group products to the Canadian market.

Specialty and Vision will remain in Markham, ON and will reconfigure warehouse operations.

Harold Clarke, president of Specialty and Vision, has announced his retirement but in the interim he will continue to help the businesses' transition.

www.componenthardware.com

to training services and support manager. Jaron McCloy is now fabrication and design services coordinator.

Aquatherm Canada has announced that two new distributors and three new agents are now working with the polypropylene piping company. Wolseley Canada is now a distributor for Alberta, and Independent Mechanical Supply Inc. is a distributor for Ontario. JBM Sales Agency Ltd. is a new agent for the Atlantic Canada regions, and Walmer Mechanical Sales and Key to the North Sales Agency Inc. are agents for Ontario. www.aquatherm.com

ESOP NOW MAJORITY OWNER OF MALCO PRODUCTS INC.

In December 2015, Mardon Quandt, president and newly appointed CEO of Malco Products Inc., announced that the company’s Employee Stock Ownership Plan (ESOP) is now Malco’s majority owner.

Quandt said that Malco products will be almost 75 per cent ESOP-owned and Malco will be controlled by the ESOP. This is the first time in 65 years that the family of Malco’s founder, Mark Keymer, is not in control of the company.

www.malcoproducts.com

NUHEAT WORKS WITH NEST

At the International Builders Show in January, Pentair announced that Nuheat, its brand of electric floor heating, is now compatible with the Nest Learning Thermostat. Nest’s combination of sensors, algorithms and machine learning can prompt the Nuheat Signature program to react to home occupancy, which works to save energy.

The Works With Nest features work with any installed Nuheat Signature and do not require added hardware or software updates. www.nuheat.com/nest

SOFTWARE COMPANIES TEAM UP IN THE NAME OF EFFICIENCY

GPS Insight, a GPS fleet tracking technology, has announced an integration partnership with ServiceTitan, a business management software for home service companies. ServiceTitan integrates phone, GPS, customer and sales data into a single, comprehensive solution that can help to grow home service businesses.

GPS Insight customers can now connect their vehicle location data into ServiceTitan’s dispatch board. Customers of both systems can access their vehicle location data through streamlined job scheduling, and can also see technicians available for jobs.

www.gpsinsight.com



WAJAX INDUSTRIAL COMPONENTS ADDS STANCOR PUMPS TO SELECTION

Wajax Industrial Components has added Stancor Pumps L.P., a designer and manufacturer of electric submersible pumps and controls, to its Canadian product portfolio.

Rick Byers, business development manager for the Fluid

Handling category at Wajax Industrial Components said, “We have customers who are asking for durable and reliable electric submersible pumps in several different markets. Stancor Pumps are fully qualified to provide both standard and customized systems to meet virtually any customer’s specification.”

Stancor Pumps are available from ½ hp through 75 hp, with flows to 3500 gpm and heads to 450 feet or 195 psi.

www.stancorpumps.com



TECHNICIANS TO BENEFIT FROM TECHNOLOGY PARTNERSHIP

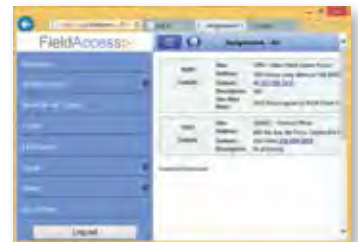
Dexter + Chaney, providers of Spectrum construction software, has announced a technology

partnership agreement with FieldConnect, Inc., a mobile workforce platform that aims to streamline communication and improve workflow efficiency. From a tablet device, technicians using Spectrum and Field Connect’s mobile solutions, can see work orders assigned to them, read notes related to the client or job, access maps and directions, upload job site photos, collect electronic signatures, and more.

Andy Holtmann, marketing communications coordinator, Dexter + Chaney, said that currently there are 35 Canadian clients, ranging from general to heavy highway contractors, as well as electrical and mechanical contractors, using the program. Holtmann explained that they are still relatively new to the Canadian market.

“We officially began selling there [in Canada] roughly three years ago, after ensuring that our software was fully compliant in Canada,” Holtmann said. He added that since the company entered Canada, business has flourished.

www.dexterchaney.com www.fieldconnect.com



WOLSELEY INDUSTRIAL ACQUIRES MEDALLION

On February 8, Bryn Murray, vice-president of Wolseley Industrial Canada Inc. announced the acquisition of all of the assets of Medallion Pipe Supply Company Ltd., a pipe

continued on 154



Bryn Murray, vice-president, Wolseley Industrial (front left), shakes hands with Gerald Guinan, formerly general manager of Medallion, and now branch manager, Wolseley Industrial Saskatoon.

supply business. Gerald Guinan, general manager, Medallion, will continue with Wolseley Industrial and will serve as branch manager for the Saskatoon location. The Medallion location will report to Jason Santha, branch area manager, Wolseley Industrial, Saskatchewan.

The purchase of Medallion enables Wolseley Industrial to expand its pipe, valve and fittings offering and customer base nationally.

In other Wolseley news, Keith Strachan, general manager, plumbing and HVAC/R, southern Alberta and mid-western Canada, Wolseley, announced the opening of Wolseley Canada's newest plumbing and HVAC/R branch. The branch is located in Airdrie, AB at 127 Kingsview Rd.

www.wolseley.com

WATERSENSE LABELING EXTENDS TO FLUSHOMETER TOILETS

The US Environmental Protection Agency (EPA) has added flushometer-valve toilets to its list of products that can earn the WaterSense label. The flushometer-valve toilet labeling specification sets a maximum allowable flush of 1.28 gpf, which is 20 per cent less water than the federal standard.

WaterSense has also incorporated a minimum flush volume of 1.0 gpf to ensure plumbing systems have adequate flow to function effectively. For dual-flush models of flushometer-valve toilets, the maximum and minimum flush volume requirements apply to both the full- and reduced-flush modes.

www.epa.gov/watersense.com

SONNHALTER BRINGS HOME A SILVER DAVEY

Sonnhalter, a marketing communications firm to the professional tradesman in the construction, industrial and MRO markets, received a Silver Davey Award at the 11th Annual International Davey Awards competition in February, 2016.

The Davey Awards honour creative work produced by small firms, agencies and companies worldwide. They are named after King David who defeated the giant, Goliath, with a big idea and a little rock.



Sonnhalter accepted the award in the Print-Collateral Brochure category for their brochure on Water Quality created for Viega LLC.

Viega LLC began its water quality initiative to educate the engineering community and prepare them for the new ASHRAE 188P standards to help reduce Legionella and other waterborne pathogens. Sonnhalter worked with Viega to create the water quality campaign, as well as the eight-page brochure to further educate the industry.

www.sonnhalter.com

ACQUISITIONS

>> DiversiTech Corp., a manufacturer of equipment pads, air conditioner condenser pads and a supplier of installation and service components for air conditioning, refrigeration, electrical and swimming pool industries, announced in January that it had purchased Cliquight Manufacturing Company.

Cliquight is a Toronto-based innovator and manufacturer of HVAC/R sealants, work lights and battery charger products. Cliquight brings numerous brands to the DiversiTech portfolio. It is known for its research and development capabilities and technical support.

These qualities, along with DiversiTech's warehousing and distributing operations, are expected to provide improved shipping and ordering efficiencies, and an expanded geographical reach. www.diversitech.com

www.cliquight.com

>> Pentair, a global provider of industrial pumps, valves, and water and filtration equipment, has purchased Erico Global Co., a company that makes electrical and fastening products.

Erico will become a part of Pentair's technical solutions division. Products and applications combined with Pentair's global infrastructure are expected to create a broader offering for customers in the commercial and industrial sectors.

www.Erico.com

>> Rheem acquired Eemax Inc., of Waterbury, CT, from The Riverside Company, a private equity firm in December 2015. Eemax is a manufacturer of electric tankless water heating solutions for residential, commercial and industrial applications in the U.S. In addition to its Eemax-branded water heaters, the company produces the EcoSmart line of tankless water heaters. The integration of Eemax into the Rheem family increases the breadth of the Rheem water heating portfolio and gives Rheem customers access to electric tankless water heaters.

www.rheem.com www.eemax.com



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MILESTONES



A photo from January 20, 1912 that shows the Weil Brothers' first annual company banquet.

WEIL-MCLAIN CELEBRATES 135 YEARS

Weil-McLain is celebrating 135 years of business this year, and can trace its history back to Chicago in 1881 when Isadore and Benjamin Weil opened a plumbing business on Randolph Street in Chicago's Loop. The company grew to become a designer and manufacturer of hydronic comfort heating systems for residential, commercial and institutional buildings.

Today the company has 600 employees and has had many milestones including the development of the first 'wet base' boiler and becoming the first company to factory 'fire test' package residential boilers.

The company will commemorate this anniversary with a year-long celebration that includes events at its manufacturing facilities and headquarters, as well as special promotions throughout the year. www.weil-mclain.com

B&G MARKS A CENTURY OF INNOVATION

Bell & Gossett (B&G), a Xylem brand, is celebrating 100 years of engineering commercial HVAC and plumbing products this year, and kicked off the festivities at the AHR Expo in January. In celebration, the company featured highly efficient pumps and energy-saving system solutions, as well as an additional education offering through B&G's Online Little Red Schoolhouse.

The course is a free, interactive, self-paced program about waterside economization that enables engineers, wholesalers and contractors in the HVAC industry to receive training through a learning app. The app can be accessed by a computer, tablet or any mobile device..

"For 100 years, Bell & Gossett has been a leader in efficiency, education and system expertise," Mark Handzel, vice president, product regulatory affairs and director, HVAC commercial buildings said in a press release from the company in January. He said that although the industry's landscape has changed over the years, B&G has continued to focus on helping customers achieve higher energy efficiency. www.bellgossett.com

PEOPLE



Gilles Legault

Gilles Legault has joined Viega's sales team as district manager in Canada's Eastern Sales District (Quebec). Legault has more than 20 years of experience in the plumbing and heating industry, having held positions with Hilti, CB Supplies and REHAU. He has been involved in industry improvement through his participation in industry associations, most recently completing his term as president of the Quebec Region of the Canadian Institute of Plumbing and Heating.

Legault is a Certified Hydronic Designer, as recognized by the Canadian Hydronics Council, as well as a Certified Designer, as recognized by the Canadian GeoExchange Coalition.



Kenneth Eggleston

Mestek has announced the promotion of Kenneth Eggleston to national sales manager for SpacePak, a manufacturer of small duct heating and cooling systems. Eggleston has been with SpacePak for five years as a project manager. Additionally, he has used his knowledge of SpacePak products to expand his role within the company, taking on responsibility in sales and training. This includes SpacePak Systems and Application seminars. Prior to joining SpacePak, Eggleston worked at Mestek's Research and Development Centre. He is a graduate of the Porter and Chester Institute for HVAC/R.



Paul Deneve

Paul Deneve has been appointed to director of sale branch operations, Ecco Supply, and has relocated to join the executive team at corporate operations located in Langley, BC. Deneve joined the company in December 1996 as a commercial/industrial sales representative with Ecco Supply, Regina branch. He was promoted to assistant branch manager in 2008.



Leo Vaillancourt

Navien has hired Leo Vaillancourt as trainer for western Canada. Vaillancourt holds a class "A" industrial gas license along with many industry certifications including IBR Residential and Commercial Design, HRAI certification, and Mechanical Ventilation systems and design. He has also served as a director and president of the Hydronics Advisory Committee and has also served on the National Hydronics Design Standard Committee where he helped to develop the new CSA B214 code. He currently serves on the board of the Canadian Hydronics Council. Vaillancourt will be based out of Vancouver, BC.

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Meeting the challenge of Standard compliance and energy cost reduction

Outdoor air ventilation seen as a means to curb incidents of hospital acquired infection (HAI).

BY STEVE ULM

The healthcare industry is at a crossroads with the increased incidence of hospital acquired infections (HAI) and the HVAC industry has the solution. HAI statistics spell a sense of emergency. One in every nine patients acquires HAI once entering a Canadian hospital, according to the Canadian Union of Public Employees (CUPE). This has resulted in 220 000 incidents and 8500 to 12 000 patient deaths annually in Canada.

To offset the trend, hospitals worldwide are looking to reduce the HAI trend via 100 per cent outdoor air HVAC systems in an air replacement strategy. A minimum of two times per hour, the entire air volume in a hospital can be replaced by introducing 100 per cent outdoor air, and in turn, exhausting interior air along with any of its potential airborne contaminants. Specialty areas, such as surgical suites, may require additional air changes.

Air replacement is a viable strategy, but it is cost-prohibitive to dehumidify, heat or cool a huge volume of air that can surpass one million CFMs in large facilities. Facility engineers walk a tight-rope of reducing operational HVAC energy costs while also complying with ANSI/ASHRAE/ASHE Standard 170, Ventilation of Health Care Facilities.

Furthermore, the challenge for hospital management is to maintain code compliance even though relative humidity (RH) levels between rooms such as a corridor, patient room and surgery

suite, for example, can vary. Regardless of safe design precautions such as controlling air changes and a room's negative or positive pressurization, and so on, moisture will migrate from room-to-room, because of its infinity toward a drier space. Controlling the RH in each space makes it easier to control the various vapour pressures and moisture migration into other spaces.

CUTTING EXPENSES

Energy recovery ventilation (ERV) units have many advantages for cutting the expense of dehumidifying, cooling and heating outdoor air.

ERVs that dehumidify outdoor air, for example, can significantly reduce a building's air conditioning load.

Dehumidification can be accomplished through mechanical, desiccant or a combination of both methodologies. Mechanical refrigeration coils condense moisture from the air whereas a desiccant-based strategy adsorbs moisture with desiccant wheels.

Heat recovery is also an ERV advantage, because of the significant energy cost reduction potential. ERVs can use exhaust air to preheat or pre-cool the outdoor air before it is conditioned for a set point such as 22C (72F). For example, heating -23C (-10F) outdoor air in January to 22C (72F) is a significant expense. However, using 18C (65F) exhaust air to preheat the outdoor air will deliver significant savings.

Enthalpy wheels are ideal for heat recovery, but in hospitals, the wheel's desiccant media choice—typically silica gel or molecular sieve material—is critical for preventing the incoming outdoor air from residual contamination from the outgoing indoor air.

Silica gel has a propensity for cross contamination because its pores can adsorb and harbour contaminants from the exhaust air. This can also decrease latent heat transfer. Molecular



This conventional cooling, active desiccant dehumidification system delivers and controls low dew point air while minimizing regeneration energy input. Designed for hospitals, archival storage and hotels, the AHR Innovation Award winning unit delivers supply air humidity levels as low as 15 grains. Since exhaust heat recovery is not needed, the unit is suited to applications requiring 100 per cent outdoor air.

sieve materials, on the other hand, are not susceptible to contaminant adsorption, because the smaller pore size only allows the transfer of the water vapour from the exhaust to supply air streams.

In winter, when outdoor air is uncomfortably below 30 per cent RH, humidity collected from the exhaust air can be added to the supply air to raise indoor RH levels. Obviously, it is critical to not contaminate outdoor air with indoor contaminants during the humidification process, because of HAI concerns.

To further minimize cross-contamination, desiccant surfaces can be specified with anti-microbial coatings to help prevent airborne biological contaminants from harbouring in the media.

SPECIALTY CONCENTRATION

Other hospitals are using energy recovery and humidity reduction in critical areas, such as surgical suites, which typically demand very low dew point temperatures C (42F) and drier air, as per ASHRAE 170 requirements. The trend is to design operating rooms (OR) with their own self-contained system to avoid contact with air from other parts of the hospital.

Conventional enthalpy equipment typically cannot handle such low dew points; however the HVAC industry has recently developed alternative dehumidification strategies that utilize an active desiccant wheel to dry out the air to very low levels. These systems bring in outdoor air and use a cooling coil that reduces the temperature to approximately 12C (55F), and then an active desiccant wheel takes the saturated cooling coil's moisture and dehumidifies it by adding heat.

The dried air leaves the wheel in the 26C (80F) range, but at a -1C (30F) to 4C (40F) dew point temperature. The air can then be fed to conventional air handlers for the space's sensible cool-

CANADIAN CASE IN POINT

A hospital poised to serve as a role model for future 100 per cent outdoor air applications is Montreal-based Centre Hospitalier de l'Université de Montréal (CHUM). It will be one of the largest hospital additions in North America with more than 2.5 million square feet when it is completed later in this decade. Instead of using a code minimum amount of outdoor air that is typically well below 50 per cent, as is the case with most hospitals, the mega-project will use mechanical HVAC system enthalpy wheels to reduce moisture in its 100 per cent outdoor air, 2.8 million-CFM design.

Offsetting the significant energy costs of this IAQ strategy will be 47 molecular sieve enthalpy wheels that recover heat from the exhaust air, but without cross-contaminating the outdoor air with both biological and volatile organic compounds (VOC) indoor contaminants. The same enthalpy wheel types will also reduce the cooling load and energy costs by dehumidifying high RH outdoor air before conditioning it. Keeping indoor humidity below 60 per cent RH (specifications require 20 to 60 per cent) will minimize airborne microbial procreation.

Because of Montreal's seasonably dry winter air, indoor moisture recovered by the enthalpy wheels will also pre-treat outdoor air to raise RH, instead of exhausting it outside. This safeguards against low indoor RH levels that can dry out human olfactory systems and increase illness susceptibility.

Aside from the estimated millions of dollars in energy savings over the operational life of CHUM, the system will also help the project attain a Leadership in Energy and Environmental Design (LEED) silver certification. The downsizing of mechanical equipment due to the energy recovery strategy and other sustainable efforts expects to displace approximately 40 000-tons of carbon emissions annually. Furthermore, an estimated 55-million litres of cooling tower water will be saved annually due to cooling system reductions.

ing. These systems deliver dry air on the ventilation portion only and decouple (remove) the humidity from the space with just the outside air portion. Another attribute is no cross-contamination between the indoor and outdoor ventilation during heat recovery. The ventilation is only 20 to 30 per cent of the total air volume, so moisture removal is handled energy efficiently.

Many hospitals are currently retrofitting operating room HVAC systems to comply with ANSI/ASHRAE/ASHE Standard 170 requirements for humidity control. This may require either adding a dedicated outdoor air dehumidifier (DOAS) to the operating

room's air handler, or replacing the air handler with a DOAS that performs dehumidification and controls space heating/cooling.

The next decade will see hospitals adding improved moisture control combined with energy recovery to control operation expenses and to provide healthier patient IAQ environments.

Steve Ulm is the marketing director at Semco LLC, a Fläkt Woods Company specializing in energy recovery equipment, chilled beams, controlled chilled beam pump modules, spiral metal ductwork and acoustical panel products. Ulm can be reached at steve.ulm@flaktwoods.com.

INOX:

a four-letter acronym for change

The stainless steel option and its influence on the design and installation of potable water systems.

BY MARK EVANS

Over the course of time, many changes to the National Plumbing Code (NPC) were related to the first-time inclusion of new technology. In Europe, INOX or stainless steel has been used for decades in piping interior building systems including potable water, even in the single-family residential context. That has not been the case here in Canada, where this is a fairly recent phenomenon.

While there are some first time changes for 2015, one of the most notable changes ushered in with the publication of this new version is the inclusion of stainless steel pipe and fittings for interior building service use, specifically in potable water systems without the requirement for a Variance or “alternative solution.”

Why is there an interest and enthusiasm in having stainless pipe OK'd for use in plumbing systems? One reason would be pipe sizing versus copper. Like most polymer piping systems, the design flow in feet per second (FPS) or

metres per second (MPS) allows for higher flow rates in stainless pipe than does copper. As an example, in BC the flow rate limitation for copper is three FPS on hot water lines and four FPS on cold water lines. By contrast, the City of Vancouver allows flow rates of up to eight FPS in stainless piping, allowing smaller diameter stainless to be utilized in equivalent systems.

This change to the NPC has been discussed for some time and recognizes a material, which has an extensive history in our industry. In Canada, stainless steel has been specified and installed as part of our infrastructure in water treatment facilities for many years. Recognizing this, many authorities having jurisdiction (AHJs) at the civic and provincial levels, have moved to streamline or eliminate the need for alternative solution submissions by issuing regulations to permit the use of stainless in potable systems.

A PARTIAL LIST OF AHJs MOVING TO ADJUST OR ELIMINATE REQUIREMENTS

1. The City of Saskatoon

www.saskatoon.ca/sites/default/files/documents/community-services/building-standards/stainless_steel_pipe_and_fittings.pdf

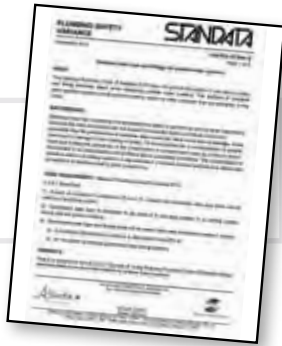


2. The City of Vancouver

<http://www.bccodes.ca/vancouver-bylaws.aspx>

3. The Province of Alberta

www.municipalaffairs.alberta.ca/documents/ss/STANDATA/plumbing/pv/VAR-P08-02Rev1-PotableWaterSystems.pdf



4 The Province of Quebec

www.cmmtq.org

These bulletins all contain some reference to the material requirements of the products suitable for use, listing alternatively either or both of:

- **ASTM**

- Pipe or tubing- Type 304/304L or 316/316L
 - A269, A312 or A312m, A778

- **ASME**

- Pipe or tubing
 - B36.19m, B16.19

While some have required an NSF/ANSI 61 listing on pipe, not all have required this on the fittings. The City of Vancouver has called this out specifically, requiring NSF/ANSI 61 markings on both the pipe and the fittings. It is unclear if this requirement will change over time.

On the NSF International web site there is a great Q&A, which addresses the issue of the suitability of stainless for potable water systems.

Q: "Are all stainless steel products compliant with NSF/ANSI 61?"

A: "No. Only products that are certified to NSF/ANSI 61 can be assumed to meet the requirements of the standard. Certification to NSF/ANSI 61 includes product testing and production location auditing to ensure ongoing compliance with the health based requirements of NSF/ANSI 61. This includes testing products on an annual basis, by exposing them to different formulated waters (typically at pH 5, pH 8 and pH 10) and testing for regulated metals such as antimony, arsenic, barium, cadmium, chromium (including chromium VI), copper, lead, mercury, selenium, thallium, and nickel, as well as any other inorganic and organic

DESIGN GUIDELINES PUBLISHED BY THE NICKEL INSTITUTE OUTLINE THE FOLLOWING:

- Flow Rate (feet per second)
 - Water Lines
- Closed cooling and cooling water 12 (FPS)
- General service piping including drinking, fire fighting, raw and de-mineralized water lines 10 (FPS)
- City service piping seven (FPS)
- General pump suction lines three (FPS)



Figure 1 Preliminary: Adoption of the NPC of Canada 2015

Jurisdiction	Timeline for 2015 NPC Adoption
British Columbia	BC will adopt model 2015 NPC (with some variations) in 2017
Alberta	Alberta regulation 227/2012 should be updated by Fall 2016 without amendments through an automatic code adoption process under the Safety Codes Act
Saskatchewan	Saskatchewan has not adopted NPC 2010
Manitoba	Manitoba plans to adopt the next version of the Code in April 2016
Ontario	Jan. 1, 2014 O. Reg 332/12 (2010 NBC and 2010 NPC with Ontario Amendments)
Québec	NPC 2015 with Quebec amendments in 2018
New Brunswick	Potentially 2019
Nova Scotia	NPC 2015 anticipated Summer 2016
Prince Edward Island	The 2015 NPC will be adopted for PEI early in 2016. There is a legislative process involved [to adopt new code into regulation].
Newfoundland and Labrador	Mid 2017 (estimated)
Yukon Territory	NPC 2015 anticipated to be adopted Spring 2016, as per the provisions of the Yukon Building Standards Act
Northwest Territories	N/A
Nunavut	N/A

Note: This is not an official timeline (It is an anticipated estimate by the AHJs). CIPH continues to solicit feedback from the provinces as to when they would reasonably be able to adopt the 2015 National Plumbing Code into regulation.

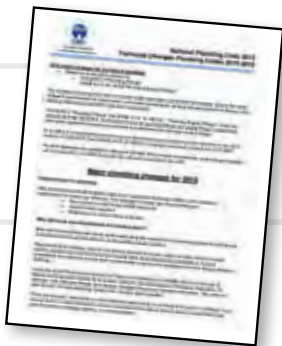
leachate concerns that may derive from cutting oils, lubricants, process aids, welding, machining, and other forming by-products. The certification process also includes annual unannounced inspections of the manufacturing facility to verify that the manufacturer is making the product using the same raw materials, material suppliers and production process as the products that are tested."

Go to www.nsf.org/q-and-a-all/qa-detail/nsf-ansi-standard-61 for further information, including how to search for

continued on 162

“...many authorities having jurisdiction (AHJs) at both the civic and provincial levels, have already moved to streamline or eliminate the need for alternative solutions submissions by issuing regulations to permitting the use of stainless in potable systems.”

[www.ciph.com/assets/js/ckeditor/kcfinder/upload/files/National_Plumbing_Code_2015_Changes_2015_11_26%20\(2\).pdf](http://www.ciph.com/assets/js/ckeditor/kcfinder/upload/files/National_Plumbing_Code_2015_Changes_2015_11_26%20(2).pdf)



companies who have listed (compliant) products.

The Canadian Institute of Plumbing & Heating (CIPH) recently hosted *What's going on in Canada: A Codes and Standards Webinar*, where the question of the pending changes related to the inclusion of stainless pipe systems was addressed. See [www.ciph.com/assets/js/ckeditor/kcfinder/upload/files/National_Plumbing_Code_2015_Changes_2015_11_26%20\(2\).pdf](http://www.ciph.com/assets/js/ckeditor/kcfinder/upload/files/National_Plumbing_Code_2015_Changes_2015_11_26%20(2).pdf) for some background on why this change has developed in the market.

An important issue addressed in the webinar was that of implementation. Not all provinces operate concurrently with their amended version of the National Plumbing Code. Thus, even though the 2015 National Plumbing Code has now been published, the changes therein, including this change making stainless pipe systems permissible may not come into effect in your area for some time. See *Figure 1*, an adoption timeline by province as noted by CIPH in the document referenced in the link above.

While Canada has not adopted universal lead-free requirements for all plumbing system components, stainless steel pipe and fitting systems do present another piping system option that can be compliant.

A visit to the NSF website also provides information on understanding plumbing products marking at www.nsf.org/consumer-resources/health-and-safety-tips/water-quality-treatment-tips/plumbing-product-markings. “Since January 4, 2014, manufacturers wanting to sell plumbing products in the U.S. must demonstrate that those products do not contain more than 0.25 percent lead if the product is intended for contact with drinking water. The weighted average lead content of a product is determined by multiplying the lead content of each component that is in contact with water by the surface area of that component, then dividing this number by the entire water contact surface area of the product. Products produced prior to 2014 that met this re-

quirement may be marked with NSF/ANSI 61G, NSF® pw-G, NSF/ANSI 372 or NSF® 372, while products produced after January 4, 2014 may display an NSF/ANSI 61, NSF® pw, NSF/ANSI 372 or NSF® 372 marking.”

An earlier webinar presented by CIPH, titled *Update on Low Leaded Plumbing Products in Canada*, also addressed some pending changes related to Low Lead requirements in Canada, specifically:

2010 INTERIM CHANGES FOR LOW LEAD IN PLUMBING

Reference to the 2012 editions of:

- CSA B125.3 “Plumbing Fittings”
- ASME A112.18.1/B125 “Plumbing Supply Fittings”

The ill effects of exposure to lead on human health have been well known for decades. Due to the more stringent requirements for lead content in American jurisdictions, limiting the lead content for fittings in the NPC has been recognized. CSA B125.3 Plumbing Fittings and ASME A112.18.1/B125.1 Plumbing Supply Fittings, which are referenced in the 2010 NPC for the performance of plumbing fittings and supply fittings, respectively, have been updated to include requirements and definitions for low-lead content fittings.

In an effort to harmonize requirements across North American jurisdictions (with reference to the 2012 editions of CSA B125.3 and ASME A112.18.1/B125.1) changes have been made to the 2010 NPC. As other standards are updated to reference the NSF 372 low lead requirements, code change requests will be forwarded to the NRC to update the reference materials in the NPC.

At this point, it remains to be seen how much the stainless option will influence design and installation given the choices in PE-x, PP-RT, PE-RT, CPVC and other non-ferrous materials available for use in plumbing systems. As is the case with other piping choices, corrosion resistance, flushing and cleaning, expected service life, warranty and flow rates remain as factors to be considered when designing and installing potable and process piping systems in buildings.



Mark Evans has held positions of increasing responsibility at the regional and national level of the wholesale supply, rep agency and manufacturing sectors of the plumbing and heating industry.

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A look at the bottom line

What kind of business has the best sales appeal?

By Mark Groulx

There is a demand in the marketplace for HVAC/R businesses but who are the buyers? They are almost always bigger companies in the same industry. If a company is quite large, say \$5 million in pre-tax profit, private equity buyers and private high net worth individuals will consider purchasing them.

In the contracting industry, it is usually bigger contractors or distributors in the same sector who are the buyers looking to grow by acquisition. Often times buyers are looking to diversify geographically so they can provide service to their existing customers in several locations.

Generally speaking, it is a strategy to accelerate growth. The buyer is looking to increase capacity by acquiring the company's infrastructure, tradesmen and related skills to allow them to undertake more and bigger jobs.

In terms of what makes a company appealing to a buyer initially, in most cases it is the bigger the better. It is not top line or sales revenue numbers that are most important.

It is the bottom line. The mergers and acquisitions (M&A) world is focussed on EBITDA (earnings before interest, taxes, depreciation and amortization).

This sounds like a mouthful but it is pretty straightforward. Go to your year-end income statement, look at the pre-tax net income then add any interest, depreciation and amortization on the statement and that is your EBITDA. Once the EBITDA is calculated, a buyer will multiply that number by a multiplier that is based on a number of factors, which are discussed below, to determine the purchase price. So guideline number one is to maximize your EBITDA, which is based on your bottom line profitability.

Once the EBITDA is calculated you want as high a multiplier on that number as possible because the result is the purchase price. The multiple could range from two times to eight times so a company with \$1 million of EBITDA could be worth anywhere from \$2 million to \$8 million.

The single most important factor to increase the multiple is

to show recurring revenue, that is, sales that recur year in and year out. Maintenance contracts are a very good example of this. If you provide ongoing maintenance to a long list of customers that pay you for servicing their systems several times a year, you will get a higher multiple. The more you can show to a buyer that revenues and profits will continue to occur in the future, the higher the multiple you will get. The opposite is project work. If all your work is bid/spec, project-based work you do not have much certainty of future sales or earnings.

Other factors that will help the multiple are steady growth trends. If your sales and earnings have been growing steadily in recent years, it is usually a safe assumption that this will continue. If the company is well organized with systems and processes in place that will also increase the multiplier. If there is a good management team (not dependant on the owner to be there to run the business), a good performance record (on time and on money), a good safety record, a minimal amount of "normalizations" and good record keeping – these will all contribute to a higher multiplier.

The infamous "normalization" calculation deserves a brief comment. It is not uncommon for business owners to put a fair amount of personal expenses through the company. These include spouses and relatives on the payroll who do not actually work there, vacations, cars and boats. Buyers will allow for some of these expenses to be added back to the EBITDA calculation but if you are preparing to sell your business you should try to have a minimum of personal expenses in the business. For all those expenses you take out of the business you will be paid that amount times

the multiplier as part of the purchase price.

Selling your business is a complicated process. You need to prepare a Confidential Information Memorandum that summarizes your business, its ownership, management, employees, customers, suppliers, competitors, growth opportunities, as well as financial summaries of the income statement and balance sheet. This is the information a buyer needs to assess whether they want to buy the business and at what price.

You then need to prepare a buyer list that details the most likely buyers for the business and all related contact information. Next, a secure, password protected, online data room needs to be prepared to store all documentation required for due diligence. After all that is done in advance, you then have to negotiate a deal, which includes technical matters such as working capital adjustments, as well as numerous terms and conditions.

For companies with \$1 million or more of EBITDA it is wise to get an M&A advisor to assist you and in fact, manage the process. For smaller companies it is advisable to speak with your accountants and lawyers to assist you in the process.

Mark Groulx is the president and founder of AIM Group Canada Ltd., business brokers who arrange mergers and acquisitions, divestitures and management buyouts across the country. He has led numerous successful transactions from origination through preparation, structuring, negotiation and closing across several industries in his more than 20 years with AIM. He can be reached by e-mail at mark@aimgc.ca.

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- Yes No

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- 5 - 9 50 - 99 500 - 999 Unknown
- 10 - 19 100 - 199 1000 - 2499

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What will the impact of tax changes be on business?

A dozen factors influencing taxation in the coming years.

BY HANK BULMASH



In the recent federal election, Justin Trudeau ran on a program of increased infrastructure spending to be paid for by borrowing money. That turned out to be both popular with the electorate and also feasible. Most of us acknowledge that there is a desperate need in the country for infrastructure improvement. Happily, borrowing is not difficult since Canada's federal debt is fairly low.

Trudeau also put forward a program designed to tax higher income earners and reduce the tax on middle-income families. Trudeau claimed that these proposals were not aimed at increasing tax revenues. He maintained that the tax changes would be revenue neutral. That is a reminder that the Tax Act is not just used by the government to obtain money. It is also used as a tool for social engineering. In this case, the Liberal's goal is to redistribute wealth in the country.

That sounds good, as all politicians' promises are meant to, but the result of the proposed tax changes will mean that many small business owners will feel a harsher tax bite beginning in 2016. The Liberals came into power in October 2015 and they moved very fast. They brought down a mini-budget just two months later in December. Another budget is expected this month (March 2016).

When the impact of the tax changes become widely understood, many people who voted Liberal may regret that decision. But it is important to recognize that the movement to tax higher income earners had already started under the Harper government. The Conservative perspective did differ in one important way. Harper's goal was not social engineering. They simply recognized that the federal government needed money, mostly to offset the loss of revenue from the oil patch.

THE MAJOR LIBERAL CHANGES LOOK LIKE THIS:

1. There will be a new high tax rate on taxpayers earning over \$220,000. In Ontario the increase in the maximum rate will be four per cent to 53.5 per cent. In BC the maximum will increase to 47.7 per cent and in Alberta it will increase to 48 per cent. At one time \$220,000 might have been a lot of money, but with the recent decline in the dollar it is worth \$158,000 USD.
2. Tax on dividends has been increasing under the Tory government. Under the Liberals the tax on dividends will be even higher. The tax on eligible dividends (basically dividends paid by public companies) will be 39 per cent in Ontario. The same tax is much lower out west – it is about 31 per cent in both BC and Alberta.

continued on 170

“When the impact of the tax changes become widely understood, many people who voted Liberal may regret that decision.”

3. The tax on non-eligible dividends is much higher. Non-eligible dividends are dividends paid to you by a private company out of active business earnings. Those dividends will be taxed at 45 per cent in Ontario and about 40 per cent in BC and Alberta. Not long ago these dividends were taxed at 33 per cent.
4. There will be a reduction in the TFSA limit. The annual limit will be rolled back to \$5,500 from its current \$10,000. Unused annual amounts will continue to roll forward.
5. After a very brief existence, the family tax cut will be ended. The tax cut allowed for an income splitting benefit with a low-income spouse. The benefit was designed to help families with one high-income earner and a child under 18.
6. Families with income above \$200,000 will no longer be eligible for the Child Tax Credit.

SOME THINGS FOR THE FUTURE

7. There had been talk of increasing the age of eligibility for OAS. The Liberals have stated they will maintain the benefit at age 65.
8. The Liberals have suggested that they will consider increasing CPP maximums in the future, which will lead to higher federal payroll taxes. This may mean that Ontario will drop its plans for an Ontario pension plan.
9. The Liberals have stated that they are philosophically opposed to the low small business rate being used by high-income earners rather than supporting small business. Quebec recently eliminated the small business rate on small corporations that did not have more than three full time employees. There is a possibility that the federal government will come out with similar provisions in its March 2016 budget. The Quebec government has said its move will mean 75THINSPACE000 companies in the construction and services sector will no longer qualify for the small-business tax rate.

TWO AMENDMENTS LEFT OVER FROM HARPER THAT WILL REDUCE SMALL BUSINESS TAXES

10. Under then Prime Minister Harper's June 2015 budget, the small business tax rate will drop two per cent in stages from 2016 to 2019.

11. CCA Class 53 was introduced in June 2015. This new class will allow the rapid 50 per cent depreciation of equipment used for the manufacture or processing of goods in Canada.

AND FINALLY...A VERY SCARY CHANGE

12. You may be aware that an intercorporate dividend paid by a subsidiary to a parent is tax-free. In fact, the recipient company does not need to be a parent – it can simply be connected to the payor company. Two companies are connected if one owns more than 10 per cent of the shares of the other. That is a really useful provision since it allows funds to be shifted between members of a corporate group. Also it allows dividends to be paid from an opco subsidiary to a holdco parent, which is a primary means of creditor-proofing an active business.

The Conservative government proposed major changes to section 55 of the Act in its April 20, 2015 budget. The new section 55 would do away with many of benefits of easy tax-free intercorporate dividends. The changes were made in response to a specific court decision that the Canada Revenue Agency lost. The court case dealt with a transaction by which a company was able to convert a taxable capital gain into a tax exempt dividend. Without going into the complicated details, the Department of Finance's solution to what they perceive as an abusive transaction is remarkable for the imposition of costs that it will load onto the small business sector.

Professional tax groups have made the Ministry of Finance aware of the many difficulties this poorly devised proposal would create. The Conservatives did not respond to these expressions of concern, but the proposal has not been put into a Bill as yet. The problem is that the budget proposed that the new rules cover all dividends declared after April 20, 2015. That was nearly a year ago, and many companies could be trapped by the new rules if they are passed now with retroactive dating. Hopefully, the next Liberal budget will make major changes to this proposal.



Hank Bulmash, CPA, CA, MBA, TEP, is CEO of Bulmash Accounting Professional Corporation in Toronto, ON. He can be reached at hank@bulmash.ca.

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