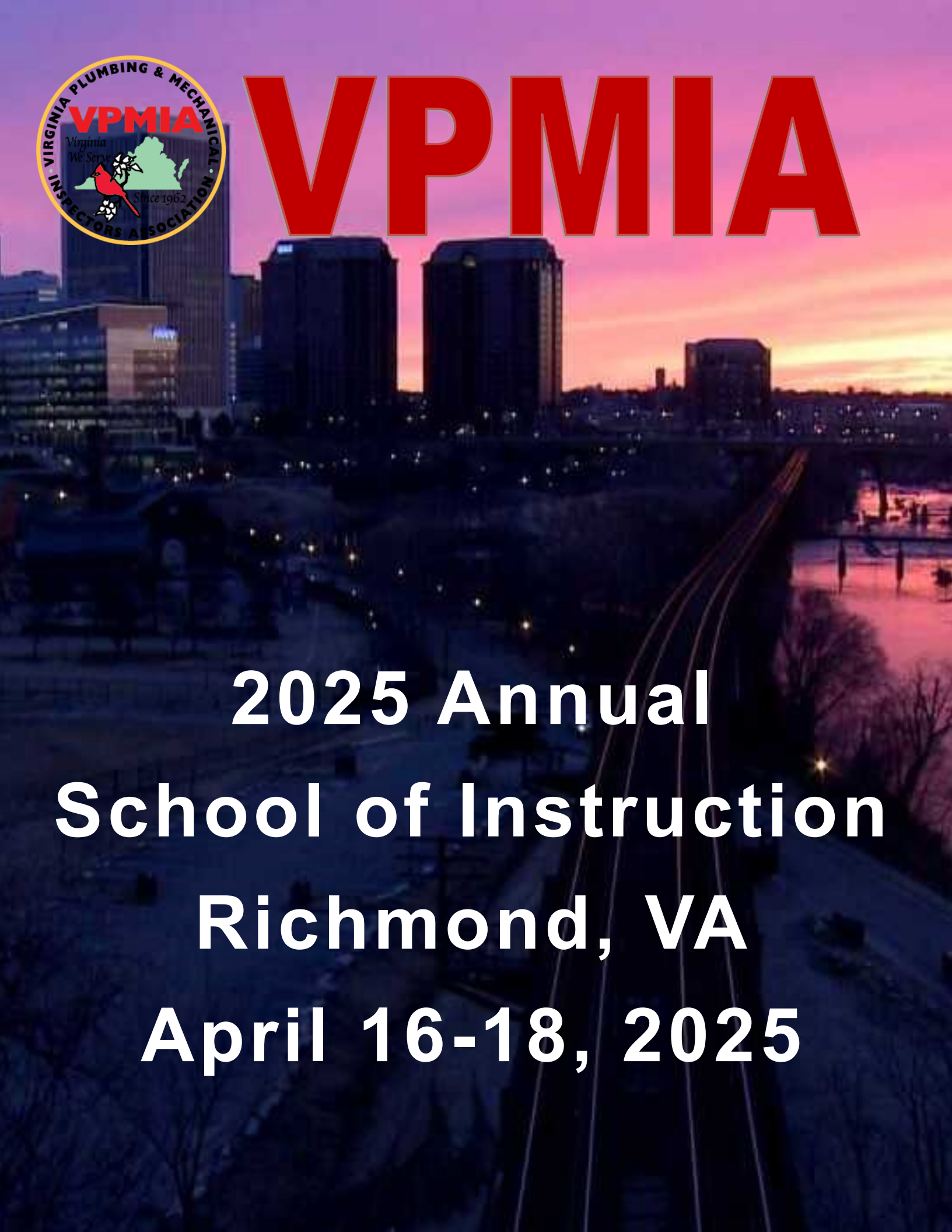
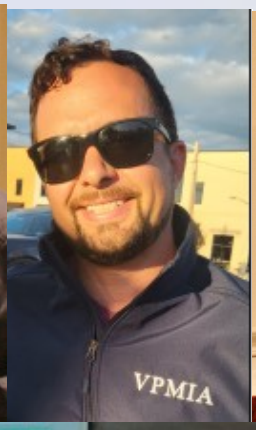

VIRGINIA PLUMBING & MECHANICAL INSPECTORS ASSOCIATION
VPMIA
Virginia We Serve
Since 1962
VPMIA
2025 Annual
School of Instruction
Richmond, VA
April 16-18, 2025

Welcome to VPMIA's 63rd School of Instruction

Table of content



PO Box 6005
10405 Dow Gil Rd
Ashland, VA 23005

Phone: (804) 798-2600
Fax: (804) 798-1356
ottosales.com

Manufacturers Representatives

Proudly Serving Virginia, District of Columbia, Maryland, South West Virginia, Southern Delaware, North Carolina

Acudor
Access Doors
acudor.com

Advance Tabco - Commercial Stainless Steel Sinks, Tables and Accessories
advancetabco.com/plumbingzone

Allied - Medical Gas Products: Outlets, Valves, Alarms and Manifolds
alliedmedicalllc.com

Amico - Medical Gas Products: Outlets, Valves, Alarms, Manifolds, Compressors, Vacuum Systems
amico.com

Aqua Treatment Services - Packaged Rainwater & UV Disinfection, Water Treatment, Softeners
aquat.com

CCI Piping Systems
Mechanical Seals and Wall Sleeves
ccipipe.com/products/wrap-it-link

Chromalox
Heat Trace Cable and Controls
chromalox.com

Ecovie - Commercial Grey Water Recycling, Rainwater Collection, Storm Water Management
ecoviewater.com

Evac - Vacuum Plumbing Systems
Fresh Water Generation
evac.com

Goss Equipment - Oxy-Fuel, Air Acetylene, Air Propane, Air Propylene and Nitrogen Equipment
gossonline.com

Hydrotek International
Sensor Faucets and Flush Valves
hydrotekintl.com

Intewa - NSF 350 Listed Grey Water Systems, Hydraulic Jump Pre-Filters for Rainwater Harvesting
intewa.com/en/home

Judo
Automatic, Self-Cleaning Water Filtration Systems
judo.eu/en-ca/products

Kemper Water Control Systems - Innovative Systems for Protection of Potable Water Quality
kemperwatercontrol.com

Leonard Valve Company
Temperature Control Valves
leonardvalve.com

Mifab - Specification Drainage, Trench Drains, Interceptors, Light Commercial Drainage
mifab.com

North Star Water Treatment Systems - Commercial/ Residential Water Softeners and Treatment Systems
northstarwater.com

QuantumFlo - Domestic Water Booster Pumps Intelligent Controls, Custom Rainwater Systems
quantumflo.com

Town & Country Plastics - Laboratory Products, Acid Neutralization/Dilution Tanks and Lab Sinks
townandcountryplastics.com

T-Drill
Mechanically Formed Copper, Stainless Steel Tee's
t-drill.com

Willoughby Industries - Ligature Resistant Fixtures, Security Products and Electronic Water Management
willoughby-ind.com

Wiseman - Industrial Chemicals for Plumbing, Heating, Drainage, Building, Janitorial and Bathroom Industries
wisemanind.com

President's Message

As President of the Virginia Plumbing and Mechanical Inspectors Association (VPMIA), I am proud to stand alongside a group of dedicated professionals who represent the strength, leadership, and expertise that define our industry. Together, we play a pivotal role in ensuring the safety, quality, and efficiency of the plumbing and mechanical systems that serve our communities.

At VPMIA, we believe in the power of unity. Each one of you contributes to the collective strength of our association, and it is through our shared commitment to professionalism and high standards that we continue to lead the industry. Our inspectors are not only the backbone of the organization, but also vital to the broader public safety and wellbeing of Virginia. Your dedication to excellence is evident in the work you do every day to uphold the integrity of the systems we oversee.

Education remains at the core of our mission. In a rapidly evolving industry, it is essential that we stay ahead of new codes, technologies, and practices. Through ongoing training and development, we ensure that our inspectors are equipped with the knowledge and skills necessary to navigate the challenges of an ever-changing landscape. By prioritizing education, we continue to strengthen our ability to serve the communities we protect.

However, the importance of maintaining our credentials cannot be overstated. Our professional certifications are more than just a symbol of achievement—they are a testament to the competence, integrity, and commitment that each of us brings to the profession. Staying current with certifications ensures that we are not only compliant with industry standards, but also that we remain trusted experts in the field. It is crucial to continue investing in our personal and professional growth to ensure the future success of VPMIA and the industry as a whole.

As we move forward, let us remain united in our shared purpose and responsibilities. Together, we will continue to uphold the highest standards of safety, quality, and professionalism.

Thank you for your ongoing dedication and service to our association and the communities we serve.

Sincerely,

Fred Crowell

VPMIA President

2025 VPMIA SPRING SCHOOL OF INSTRUCTION AGENDA

Wednesday April 16th

6:00am-7:00am Breakfast

7:30am - 8:00am Registration/Sign in

8:00am - 9:30am A2L Refrigerants In The 2021 Code

9:30am - 10:00 am Break

10:00am - 11:30pm A2L Refrigerants In The 2021 Code

11:30pm - 12:00pm Report from Nominating Committee Nomination of 2024/2025 officers

12:00pm - 1:00pm Lunch

1:00pm - 2:30pm – A2L Refrigerants In The 2021 Code

2:30pm - 3:00pm Break

3:00pm - 4:30pm A2L Refrigerants In The 2021 Code

4:30pm - 5:30pm General Membership Meeting

5:30pm - 6:00pm President's Welcome

6:00pm - 7:30 pm Dinner

Thursday April 17th

6:00am-7:00am Breakfast

7:30am - 8:00am Registration/Sing in

8:00 am - 9:30 am - 2021 Significant PMG Changes

9:30 am -10:00 am Break

10:00am - 11:30am - 2021 Significant PMG Changes

11:30 - 12:00 Visit Sponsor Tables

12:00 pm - 1:00 pm Lunch

1:00 pm - 2:30 pm - 2021 Significant PMG Changes

2:30pm - 3:00pm Break

3:00 pm - 4:30 pm - 2021 Significant PMG Changes

5:00pm - 6:00pm Reception

6:00pm - 8:00pm Banquet, Awards/ Officer Installation

Friday April 18th

6:00am - 7:00am Breakfast Buffet

8:30am - 10:00am 2021 IFGC Water Heater Installation And Plastic Venting Systems. .

10:00am - 10:30am Break

10:30am - 12:00pm 2021 IFGC Water Heater Installation And Plastic Venting Systems. .

TracPipe CounterStrike
Flexible Gas Piping by OmegaFlex

Leading Supplier

for Natural Gas and Propane

Safety • Ease • Innovation • Performance

Omega Flex, Inc. has led the piping industry with its high-quality construction and commitment to exceed the industry's product and safety standards. The flexibility and long lengths of CounterStrike® CSST make it perfect for remodel and repair work. It can be pulled like wire, which minimizes the need to remove and replace walls, while at the same time potentially reducing both construction cost and shortening lead times. Omega Flex currently has over 100 patents registered worldwide and is a product and engineering driven company committed to meeting our customers' performance requirements.

For more information on CounterStrike® CSST, visit our website at tracpipe.com

OmegaFlex®

Omega Flex, Inc.
451 Creamery Way
Exton, PA 19341
1-800-671-8622
ISO 9001 Registered Company
FGP-759 Rev 1223

2024 VPMIA OFFICERS

President..... ……...Frederick Crowell II
Vice President..... ……...Peter Kapitan
Secretary..... ……...Joshua Rolfe
Treasurer……...Chris Hickey
Executive Secretary……Chris Martin
Immediate Past President…...Dennis Hart
District 1 Director . ……...Taylor Reed
District 2 Director . ……...James LaPrade
District 3 Director . ……...Brian Petty
District 4 Director . ……...Christoper Larson

2024 VPMIA COMMITTEES

Advertising/Yearbook…James Anjam - Chair
Auditing……Peter Kapitan- Chair
Award……Tom Clark - Chair
By Laws……..Skip Harper - Chair
Certification/Education...Anthony McMahan - Chair
Chris Hickey
Donald Mimms
Brian Petty
Finance……...Joshua Rolfe
Information Technology..Travers Body - Chairs
Skip Harper
Legislative……Ron Clements - Chair
Membership……...Chris Martin - Chair
Chris Hickey
Donald Mimms
Bane Compton
Brian Petty
Nominating……Dennis Hart - Chair
PMG Code Committee….Dennis Hart - Chair
Richard Grace—Vic Chair

Time & Place/
School of Instruction……Vacant - Chair

BCAAC (Ad Hoc)……Vacant

Building Safety Month
(Ad Hoc)……Tom Clark - Chair

VA Code Education Conference
(VCEC) (Ad Hoc)……Anthony McMahan - Chair
Thomas Clark

VBCOA Liaison (Ad Hoc)..David Beahm
ICC……...Avi Smith-Rose
Region 7 ICC Liaison……..Joshua Rolf
DHCD……...Sandi Morris
DPOR Liaison……Jerry Heinline


THE IRON-CLAD TRUTH:
WHEN THE WEIGHT OF THE WORLD IS ON YOU,
CISPI IS WITH YOU.
When it comes to underground installation, American-made cast iron soil pipe and fittings are made to the highest standards and verified by the CISPI mark of quality. Installation is simpler, with minimal inspection concerns, greater durability and up to 10x higher crush loads than comparable PVC, which requires complex installation due to being a flexible material. Need guidance? Trust CISPI to give you the iron-clad truth.
VISIT: WWW.CISPI.ORG/IRONCLADTRUTH
CISPI
THE IRON-CLAD TRUTH.

Proud partners with VPMIA

The JOYCE AGENCY

ABOUT THE JOYCE AGENCY

Founded in 1982 by Skipper Joyce, The Joyce Agency is a manufacturers' representative firm within the plumbing and HVAC industry. Headquartered in Chantilly, Virginia, with an additional satellite office in Newport News, Virginia, the agency proudly represents over 30 manufacturers across a five-state territory, including Washington, D.C. Our operations are structured into five specialized divisions - plumbing, specifications, specialty accounts, hydronics, and the Manufacturers Service Group (MSG) - ensuring seamless synergy and delivering optimal solutions tailored to our customers' needs.

OUR MANUFACTURERS

AMES FIRE & WATERWORKS · BEMIS · BLÜCHER · BRADFORD WHITE WATER HEATERS · CHARLOTTE PIPE AND FOUNDRY COMPANY · DAB WATER•TECHNOLOGY · DURAVIT

Eemax evolving hot water · ELECTRO INDUSTRIES · FEBCO · FRANKE · Guardian · hansgrohe · JM

JOSAM A WATTS Brand · LAARS Heating Systems Company · LEAK DEFENSE A WATTS Brand · Meditrac · Milwaukee · mti · MUELLER STREAMLINE CO.

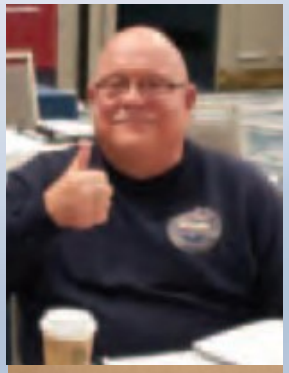
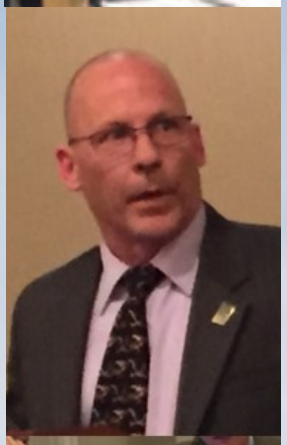
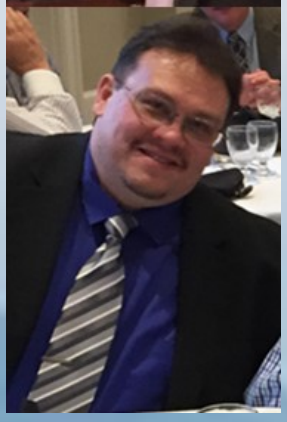
NATIVE TRAILS · OASIS · Oatey · POWERS A WATTS Brand · ReVent Ventilation Fans · SAFE-T-COVER · SCHIER

SLOAN Water Connects Us · TracPipe · WATTS · WATTS DRAINAGE

The Joyce Agency 703-866-3111 info@thejoyceagency.com

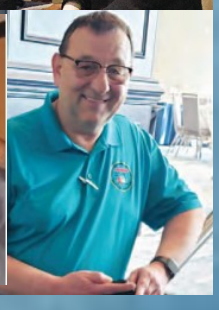
VPMIA Past Presidents

CHARLES E. MANNION 1963PAUL C. KING 1964
GORDON I. DAMERON 1965
D. PAUL JACK 1966
FRANK B. BOSMA 1967
U. EARL ALLEN 1968
HARRY CONTE 1969
JAMES B. JONES 1970
L. W. FURMAN 1971
GEORGE H. WILLIAMS 1972
W. T. DRAKE 1973
BENJAMIN BIANCO 1974
J. L. SHIFFLETT 1975
HOMER O. DENNIS 1976
JULIAN E. MEREDITH 1977
EDWARD T. PARSONS 1978
EDWARD J. BALDWIN, JR. 1979
HENRY A. RODÉS 1980
RUDOLF SCHROECK 1981
JESSE R. HURT 1982
CHARLES DEDIAN 1983
KENNETH R. SNYDER, SR. 1984
LAWRENCE J. NUCKOLS 1985
JOHN W. THURSTON 1986*
WILLIAM F. HINES 1987
LESLIE A. COURTNEY 1988
JIMMY A. ENGLISH 1989
DOUGLAS L. STOVER 1990
ROBERT M. BROOME 1991
PAUL D. HOSTETLER 1992
DENNIS W. McNAUGHTON 1993
JOHN S. TRENARY 1994
MICHAEL D. REDIFER 1995/1996
KATHLEEN T. DYE 1997
HASSEL DeSHAZO 1998
ROY N. McFARLAND, JR. 1999/2000
CLEATIS DYE, JR. 2001
CHARLES GERBER 2002
GUY TOMBERLIN 2003/2004
GEARY SHOWMAN 2005
MICHAEL THUOT 2006
JOHN SEAY 2007
DENNIS MARTINELLI 2008
JOHN MILLS 2009
WAYNE KUSHNER 2010
ROBERT ADKINS 2011
BANE COMPTON 2012
RON BLADEN 2013
PAUL RIMEL 2014
SKIP HARPER 2015/2016
RICHARD GRACE 2016
DUSTIN MCLEHANEY 2017
JAMES ANJAM 2018
TOM CLARK 2019/2020
ELLIS MCKINNEY 2021
ANTHONY MCMAHAN 2022
DENNIS HART 2023
FREDERICK CROWELL II 2024







rmi

Richmond Marketing Inc

OUR VENDORS

zurn ELKAY WATER SOLUTIONS

CHARLOTTE PIPE AND FOUNDRY COMPANY

WHITLAM The Industry Standard for Over 100 Years

AquaSHIELD PROTECTIVE ENCLOSURES

STERN-WILLIAMS

BLUE ANGEL PUMPS Ready, Come Hell or High Water.

GroovJoint

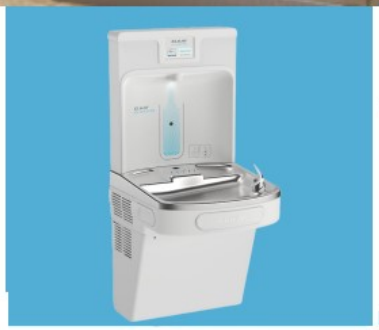
HOMESTEAD VALVE

Just manufacturing by zurn ELKAY

BK RESOURCES

Jomar VALVE

aps ADVANCE PRODUCTS & SYSTEMS, LLC



LZS8WSAP

OUR FILTERED BOTTLE FILLING STATION PROVIDE CONVENIENT AND SUSTAINABLE HYDRATION. THE PERFEC SOLUTION FOR NEARLY EVERY APPLICATION, OUR UNITS HAVE ALL TH GREAT FEATURES OF OUR ORIGINAL LINE WITH ADDED INGENUITY

Z100F FLO FORCE

Z100F FLOFORCE PARABOLIC DESIGN PROMOTES LAMINAR FLOW AND ALLOWS FOR MOST EFFICIENT WATER EVACUATION OFF THE ROOF AT LOWER HEAD DEPTHS. UNIQUE DOME AND GRAVEL GUARD DESIGN INCREASE OPEN AREA TO MAXIMIZE WATER WHILE LIMITING DEBRIS.

Charlotte Pipe HP EDGE

Learn more about EDGE HP Iron pipe and fittings systems, specifically designed for aggressive applications and installations such as Exposure to undiluted cleaning chemicals with a pH range of 2 to 12, Hospitals Casinos ,Commercial kitchens, Soda fountains, and Bar sinks

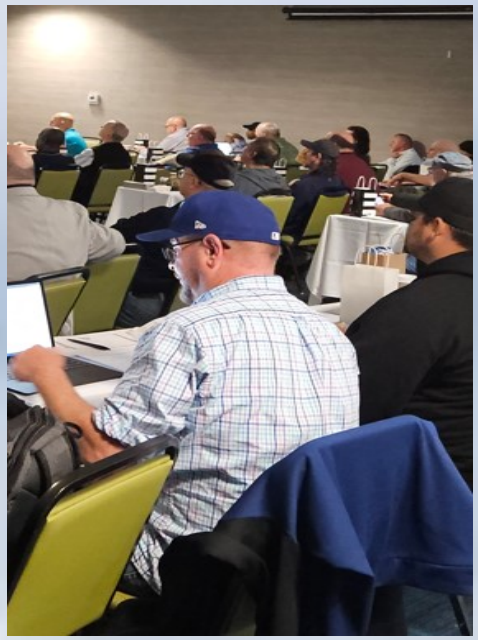
REACH US AT (804) 643-7355 /(804) 643-7380

RMISALES@RMISALES.COM

RMISALES.COM

Virginia's Code Development Process
Why YOU matter

Cindy Davis – Retired DHCD



On March 10, the Board of Housing and Community Development approved the Notice of Intended Regulatory Action (NOIRA) that begins the process of updating Virginia's Building and Fire Regulations to the 2024 codes.

Now in the event that you just rolled your eyes, or sighed, or thought….geez, we just implemented the 2021 codes and its going to start all over again? I implore you to consider just how critical your involvement is.

Submit changes, participate in the chapter code committees to voice your opinion. Attend workgroup meetings to participate in and listen to the debates. You, the code professional are needed to continue to make Virginia's codes the best in the nation.

During the last half of this year most, if not all the workgroup meetings will have been held that will largely determine the content of the Virginia Codes. As most of you know, most of the technical requirements of the Virginia Codes are based on the national model codes published by the International Code Council (ICC). However, not everything in the model codes works for Virginia. And that's why your input is critical. What works? What doesn't? What could be stated clearer? Is there a conflict somewhere? Does a term need to be more clearly defined?

I'm sure in your day-to-day use of the code, you have identified at least one if not several code sections that you believe should be changed or reworded to make the intent clearer. Now's your chance. The schedule of specific workgroup meetings will be posted on the website, so please put those meetings on your calendar and plan to participate as much as you can!

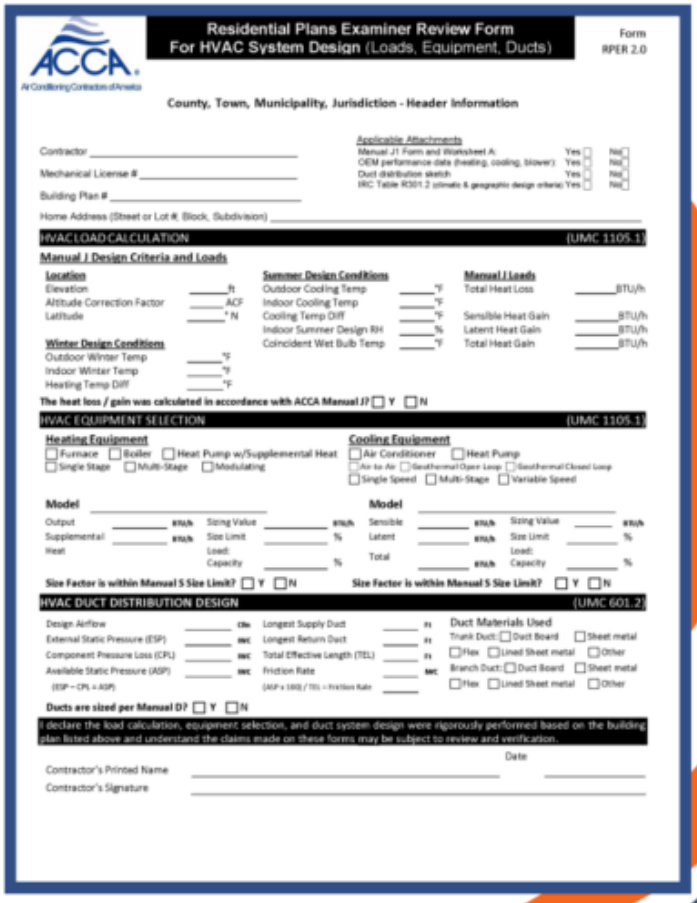
Virginia makes participating quite easy. If you cannot participate in person, you can do so through the online code development system cdpVA . DHCD staff has advised that cdpVA will open on April 1, 2025. You can submit your own proposals or comment on proposals developed by others. You can access the workgroup schedule once it has been posted and you can read the workgroup summaries after each meeting to see how the discussions went.

While the online process does make it easy to stay informed, the debate, discussion and conversation that occurs during the workgroup meetings is where final recommendations to the Board of Housing will occur. So again, mark your calendars when the schedule comes out, plan to attend in person and be the reason Virginia Codes work for Virginia! Remember, if YOU do not participate, the content of the code will be determined by others.

Be the change you want to see.

The information you need for a quick, simple evaluation of an HVAC system's design all in one place.

ACCA's Residential Plan Examiner's HVAC Review Form



ACCA
Air Conditioning Contractors of America

Residential Plans Examiner Review Form
For HVAC System Design (Loads, Equipment, Ducts)

Form RPER 2.0

County, Town, Municipality, Jurisdiction - Header Information

Contractor _____
Mechanical License # _____
Building Plan # _____
Home Address (Street or Lot #, Block, Subdivision) _____

Applicable Attachments
Manual J1 Form and Worksheet A: Yes ☐ No ☐
OEM performance data (heating, cooling, blower): Yes ☐ No ☐
Duct distribution sketch: Yes ☐ No ☐
IRC Table R301.2 (climatic & geographic design criteria): Yes ☐ No ☐

HVAC LOAD CALCULATION (UMC 1105.1)

Manual J Design Criteria and Loads

Location		Summer Design Conditions		Manual J Loads	
Elevation	____ft	Outdoor Cooling Temp	____°F	Total Heat Loss	____BTU/h
Altitude Correction Factor	____ACF	Indoor Cooling Temp	____°F		
Latitude	____°N	Cooling Temp Diff	____°F	Sensible Heat Gain	____BTU/h
		Indoor Summer Design RH	____%	Latent Heat Gain	____BTU/h
Winter Design Conditions		Coincident Wet Bulb Temp	____°F	Total Heat Gain	____BTU/h
Outdoor Winter Temp	____°F				
Indoor Winter Temp	____°F				
Heating Temp Diff	____°F				

The heat loss / gain was calculated in accordance with ACCA Manual J? ☐ Y ☐ N

HVAC EQUIPMENT SELECTION (UMC 1105.1)

Heating Equipment
☐ Furnace ☐ Boiler ☐ Heat Pump w/Supplemental Heat
☐ Single Stage ☐ Multi-Stage ☐ Modulating

Cooling Equipment
☐ Air Conditioner ☐ Heat Pump
☐ Air to Air ☐ Geothermal Open Loop ☐ Geothermal Closed Loop
☐ Single Speed ☐ Multi-Stage ☐ Variable Speed

Model				Model			
Output	____Btu/h	Sizing Value	____Btu/h	Sensible	____Btu/h	Sizing Value	____Btu/h
Supplemental Heat	____Btu/h	Size Limit	____%	Latent	____Btu/h	Size Limit	____%
		Load: Capacity	____%	Total	____Btu/h	Load: Capacity	____%

Size Factor is within Manual S Size Limit? ☐ Y ☐ N **Size Factor is within Manual S Size Limit?** ☐ Y ☐ N

HVAC DUCT DISTRIBUTION DESIGN (UMC 601.2)

				Duct Materials Used
Design Airflow	____Cfm	Longest Supply Duct	____ft	Trunk Duct: ☐ Duct Board ☐ Sheet metal
External Static Pressure (ESP)	____IWC	Longest Return Duct	____ft	☐ Flex ☐ Lined Sheet metal ☐ Other
Component Pressure Loss (CPL)	____IWC	Total Effective Length (TEL)	____ft	Branch Duct: ☐ Duct Board ☐ Sheet metal
Available Static Pressure (ASP)	____IWC	Friction Rate	____IWC	☐ Flex ☐ Lined Sheet metal ☐ Other
(ESP − CPL = ASP)		(ASP x 100) / TEL = Friction Rate		

Ducts are sized per Manual D? ☐ Y ☐ N

I declare the load calculation, equipment selection, and duct system design were rigorously performed based on the building plan listed above and understand the claims made on these forms may be subject to review and verification.

Contractor's Printed Name _____ Date _____
Contractor's Signature _____

ACCA MEMBER CODE RESOURCES

Manual J® (load calculation) resources

Manual D® (duct sizing) resources

Manual S® (equipment selection) resources

Video series: What code officials need to know about HVAC system design

Bob's House: A residential HVAC design case study

ACCA®
Air Conditioning Contractors of America

“There’s a hole in my vent pipe”
A combustion analysis quandary

David Bixby, ACCA’s manager of codes and standards

Many contractors use combustion analyzers in the field to verify safe operation of gas fired appliances. This involves drilling a hole in the vent pipe to measure flue gas elements. Once measurements are done, the hole must be sealed to return the venting system to its original condition. Existing codes and standards are silent on this process. Here’s my “deep dive” on the subject.

Codes and standards don’t cover “the hole”

Several industry codes, standards, and guidelines specify combustion safety test procedures. The Building Performance Institute (BPI), Residential Energy Services Network (RESNET), the National Fuel Gas Code (NFGC), the International Fuel Gas Code (IFGC), and even ACCA require testing or outline a procedure, but they don’t address how to return the vent pipe to its original state after taking measurements. In other words, there’s a “hole” about what to do with the hole in the vent pipe.

Then and now

The method to seal the hole so it’s safely accessible again during another service call depends on the vent material used, such as metal or plastic (i.e., PVC, CPVC, PP). For a natural draft metallic venting system, many contractors use high-temperature tape or insert a metallic plug or fitting to cover the hole. Many use a nylon plug for plastic venting systems since the flue products are lower temperature condensing. However, the suitability and durability of such plugs not been tested or proven over the appliance's life. This is not addressed anywhere in the industry. Do these nylon plugs eventually fall out due to moisture and temperature?

Vent manufacturer provides sealable test port

One manufacturer of polypropylene (PP) venting systems does provide a separate vent segment with a sealable test port for taking measurements. This venting system is listed as complying with UL Standard 1738,*Venting Systems for Gas-Burning Appliances, Categories II, III, and IV. However, the standard itself does not address how to properly provide a test port to perform combustion analysis using approved materials and procedures. This seems like a lapse in standards coverage.*

Continue

“There’s a hole in my vent pipe”
A combustion analysis quandary

Consumer questions

There are some HVACR Q&A websites where consumers are asking questions about the hole in their vent pipe. Is it covered by code? Is it authorized by the OEM? Why is the plug gone? Is it supposed to be that way? Such consumer questions can be a challenge for contractors who have to explain why having this hole drilled is necessary and safe. In addition, calling the local inspector may create an awkward situation if the inspector decides it’s not covered by code or the OEM instructions. You don’t want your customer’s appliance red-tagged. Now, the customer is mad at you and may take legal action.

Other resources

Many combustion analyzer companies do provide online tips for creating a resealable combustion test access fitting or drilling a resealable test hole. Again, these tips are not consensus industry standards. Depending on the frequency of maintenance, it’s not known how current resealable means in the field can safely last over the lifetime of the equipment.

Finding a solution

It appears to me that a good solution would be to develop a comprehensive industry consensus procedure for accessing a vent pipe to conduct a combustion analysis for gas appliances. This would take into account drilling the hole to a specific size and outline how to provide the hole with a secure means to seal it for repeated use. Let me know what you think. Contact me at david.bixby@acca.org

NSF.ORG

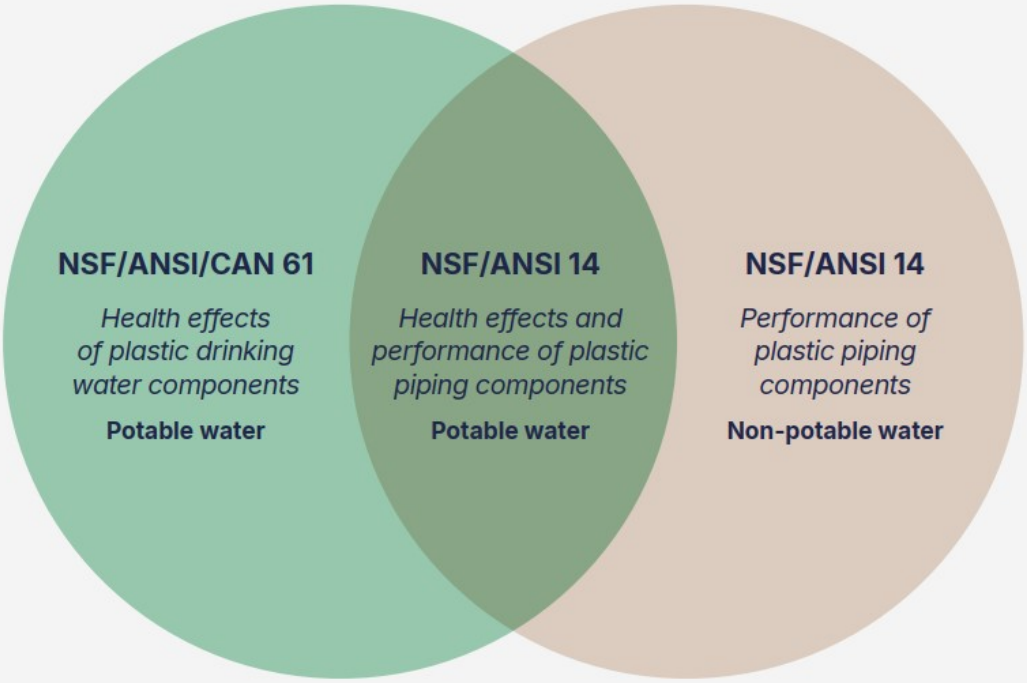
Certification Of Plastic Piping Products

NSF/ANSI 14 and NSF/ANSI/CAN 61

NSF/ANSI/CAN 61:
Drinking Water System Components – Health Effects establishes the benchmark criteria for evaluating health effects of many drinking water system components, including plastic piping.

NSF/ANSI 14:
Plastics Piping System Components and Related Materials establishes the minimum physical, performance and health effects requirements for plastics piping system components and related materials.

The Venn diagram provides a visual representation of the differences between the two standards



BOWERS

PROUD TO SUPPORT THE VPMIA

ABOUT US

Founded in 1984, Bowers is the leading Mechanical Contractor in the DMV. Our mission us to provide quality mechanical, plumbing and general construction services .

MARKETS SERVED

Mission Critical

Base Building

Commercial Service

Healthcare

Service Construction

W.E. BOWERS & ASSOCIATES, INC.

12401 Kiln Ct.
Beltsville MD, 20705
#301-419-2488
www.webowers.com

Viega, LLC

Code Officials: Contact Mike McCarthy to learn about the latest Viega products.

Learn more about the advantage of Viega's innovative piping systems. MegaPress®, MegaPress Stainless, MegaPress CuNi, SeaPress and ProPress® systems are suitable for virtually any type of project. Consider any of Viega's products for new or retrofit construction.

In addition to comprehensive product assistance, our sales force offers more to make your project successful. Benefits offered at no charge include general or specialized training, product demonstrations and Lunch & Learn sessions.

- More than 1,300 press fitting choices in multiple materials including copper, stainless, carbon steel and PEX
- Most press connections are secure and finished in seven seconds or less
- Save 60-90% on installation time as compared to other traditional pipe joining methods
- More approved applications than any other press fitting system
- System-matched tools and jaws provide a consistent connection every time

For Lunch & Learns or more information, contact:

Mike McCarthy | Technical Manager
Mike.McCarthy@Viega.us, (571) 328-1143

Based in the Northern Virginia D.C. Metro area, Mike formerly worked for a fire protection manufacturer and was a volunteer firefighter. Mike holds a Business Degree with a specialization in entrepreneurship and brings strategic business planning to the Viega team.

viega

...and these connections can be good for you.

www.vpmia.org

Your resource for trade news, information on upcoming events, membership and registration forms, archives, and current membership data.

Schools of Instruction —

DHCD-approved classes, trade-based lectures on current hot topics, opportunities to network with other code officials and industry representatives.

Membership benefits —

Reduced-cost education, a voice in international plumbing, mechanical, and fuel gas code changes, and being part of a respected, Virginia group with a commitment to excellence.

Leadership opportunities —

Become a certified instructor; serve on a Committee, or as an Officer or Board member.

Connect with VPMIA today.

Get your tools now. You can download the membership application from www.vpmia.org.

UPP

Unlimited Plumbing & Piping, LLC

COOLING

HEATING

PLUMBING

Plumbing, Heating & Air Conditioning

(703) 421-3839

Inspecting Refrigerant Detection Systems in HVAC Equipment

HVAC equipment's integral refrigerant detection system (RDS) is one of the most important safety controls to detect the presence of a refrigerant leak.

This information is provided for general guidance for code officials when performing inspections. For specific requirements, always refer to the product markings and installation instructions.

With the increased use of Class A2L refrigerants, heating, ventilating and air conditioning (HVAC) equipment certified to UL 60335-2-40, the Standard for Household and Similar Electrical Appliances – Safety – Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers, will include new safety features to mitigate the risks associated with their flammability. The equipment's integral refrigerant detection system (RDS) is one of the most important safety controls.

What is an integral RDS? An integral RDS is a system that uses one or more stationary sensors to detect the presence of a refrigerant leak at a specified concentration and automatically initiates one or more mitigating actions. When required by UL 60335-2-40, the integral RDS is evaluated as part of the HVAC equipment certification and must be installed within the HVAC equipment in accordance with the HVAC manufacturer's installation instructions. Typically, the integral RDS is designed to initiate mitigation actions within 15 seconds of detecting a refrigerant concentration of 25% of the lower flammability limit (LFL) or more.

What types of HVAC equipment will have an integral RDS? UL 60335-2-40 has detailed criteria for the third-party product certification body to determine whether equipment with A2L refrigerants requires an integral RDS. Always refer to the manufacturer's installation instructions for detailed criteria to determine whether the specific HVAC equipment is required to have an RDS and, when required, the specific installation location(s) for the RDS.

However, as a general rule, you can expect an integral RDS to be required for HVAC equipment with over a 2-pound charge for nonfixed factory-sealed equipment or over a 4-pound charge for other types of equipment.

Based on these thresholds, most HVAC equipment that uses A2L refrigerants will require an integral RDS.

(Continue)

Is the integral RDS installed at the factory, or is it installed in the field? UL 60335-2-40 allows both options. Always refer to the installation instructions for the HVAC equipment to determine if the listing requires the RDS, which particular RDS is specified, and the installation details.

As elaborated in the answers below, even in cases where the RDS is factory-installed, the sensor locations may need to be verified or changed in the field based on the orientation of the HVAC equipment.

Where are the RDS sensors located within the equipment? Class A2L refrigerants are heavier than air, so the installation instructions will typically specify a sensor location where leaked refrigerants are likely to sink and collect as determined by the criteria specified in UL 60335-2-40. Most often, this will be near the indoor coils toward the bottom of the enclosure. Units with multiple indoor coils will typically have multiple sensors.

Sensors are not typically required in portions of the equipment where the refrigerant leak would disperse to the outdoors.

What are the key points of information in the installation instructions?

- **Sensor installation location** – As noted, Class A2L refrigerants are heavier than air, so the instructions will specify that sensors are mounted in specific locations where leaked refrigerants will collect. HVAC equipment, which can be installed in multiple positions to accommodate a variety of spaces (configurable for two or more horizontal-left, horizontal-right, up-flow or down-flow), may require that the sensor be installed in different locations depending on the orientation of the HVAC equipment.
- **Wiring** – The sensor wiring must be correctly connected to the RDS controller, and the controller must be correctly wired to equipment controls to initiate mitigation actions. The control wiring may be part of a proprietary method, such as communicating controls, or through traditional thermostat wiring connections.
- The minimum wire size, insulation type and protection from damage should be verified in the field.

Connection to external devices and controls – The specified mitigation actions may require coordination with devices and controls external to the certified equipment. Terminals are provided in the RDS for these connections.

(Continue)

What mitigating actions are initiated when the RDS detects a refrigerant leak? The specific mitigation required by the certification will be specified in the installation instructions. Additional mitigation actions may be specified for installations with an engineering design following ASHRAE 15 or ASHRAE 15.2. Typically, those mitigation actions will consist of one or more of the following:

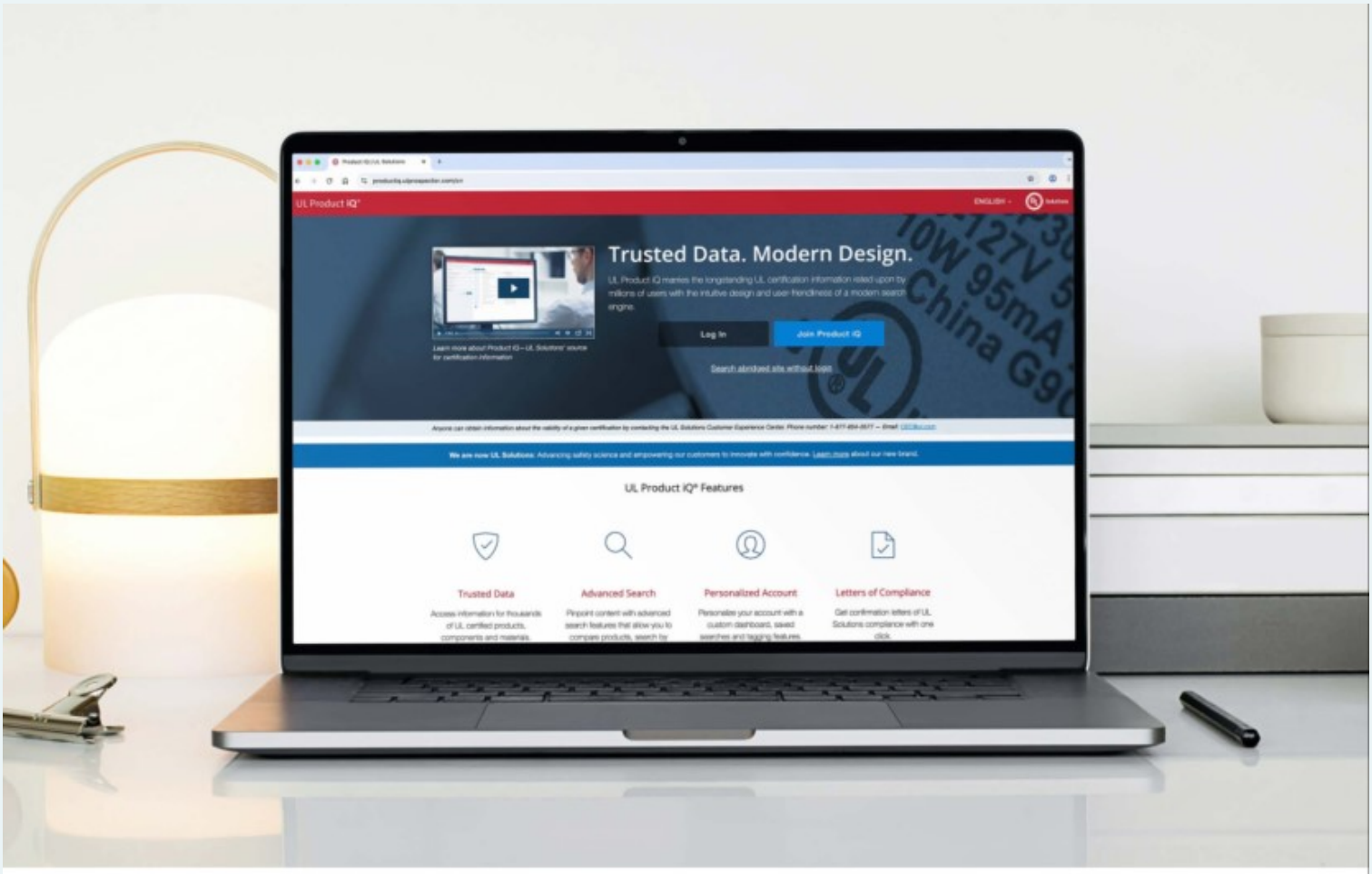
1. Turn on the indoor air-circulating fan.
2. If a zoning system is installed on ducted equipment, send a signal to the zoning system to fully open all zone dampers.
3. Turn off the compressor unless a pump-down control is specified, which requires compressor operation.
4. De-energize any potential sources of ignition such as electrical resistance heating elements or electronic air cleaners.
5. Close shut-off valves to stop refrigerant flow in circuits. These valves are typically required for units with multiple indoor coils, such as minisplits or variable refrigerant flow (VRF) equipment.
6. Initiate audible/visible alarms if installed.
7. Initiate mechanical ventilation, which is typically specified as part of an engineering design.

   The RDS must call for mitigation actions within 15 seconds of detecting a leak. This signal must continue for a minimum of five minutes before resetting.

Summary: Code authorities who inspect HVAC equipment installations should review the HVAC equipment instructions to confirm whether or not an RDS is required and, if it is, how it must be appropriately located and installed.

For more information related to these products or their certifications, please contact:

Chris Mobley, UL Solutions lead regulatory engineer, Chris.Mobley@UL.com
John Taecker, UL Solutions senior regulatory engineer, John.K.Taecker@UL.com



UL Product iQ®

The place for UL certification information

Verify UL Certification of a product or component

Locate UL guide information

Search for alternative products you can trust

Create a FREE Product iQ account today at productiq.UL.com.

UL Solutions

Safety. Science. Transformation.™

Article I. - Name, Seal, Address, and Fiscal Year.

Section 1. The name of this organization shall be the Virginia Plumbing and Mechanical Inspectors Association, herein referred to as the Association.

Section 2. The seal shall be approved by the Board of Directors, herein referred to as the Board.

Section 3. The address shall be that of the Executive Secretary, unless otherwise approved by the Board.

Section 4. The fiscal year for the organization shall be May 1 through April 30.

Article II. - Mission and Objectives

Section 1. The Association's mission shall be to promote and protect the health, safety and welfare of all Virginia citizens and of all others who may live, work, play and visit within the Commonwealth.

Section 2. The objectives of the Association shall be to:

A. Promote uniform application of the Virginia Uniform Statewide Building Code.

B. Actively participate in plumbing, mechanical and fuel gas code development at state and national levels.

C. Provide opportunities for professional development by sponsoring or conducting training seminars.

D. Partner with organizations that share the Association's mission and objectives.

E. Encourage unity among code officials, governmental agencies and the private sector.

F. Recognize members who make contributions that further the Association's mission and objectives.

G. Maintain an organizational environment which promotes professionalism, mutual respect, mentoring, leadership and the pursuit of common goals.

Article III. – Membership.

Section 1. Categories of Membership.

A. Active Membership shall be open to governmental employees actively engaged in plumbing, mechanical and fuel gas code enforcement as prescribed in the Virginia Uniform Statewide Building Code.

B. Associate Members shall be non-governmental employees interested or engaged in the building industry.

C. Lifetime Membership is open to Active and Associate members in good standing who have made significant contributions that advanced or supported the Association's mission.

D. Honorary Membership is open to individuals who are not currently members, but who have made significant contributions that advanced or supported the Association's mission.

E. Retired membership is open to Active or Associate members who have retired.

F. Student Membership is open to students actively engaged in the study of engineering, building design/construction and plumbing/mechanical apprenticeship/technical programs.

Section 2. Membership shall be granted as follows:

A. Application for Active, Associate, Retired and Student membership shall be submitted to the Executive Secretary on the Association's membership application form. Each application shall be reviewed, approved or disapproved by the Executive Secretary.

B. Honorary and special-offer type memberships shall be approved by the Board.

C. Lifetime membership nomination forms shall be submitted to the Awards Committee Chair. The Awards Committee shall review and select the recipients.

Section 3. Dues.

A. Active, Associate, Retired and Student members shall pay dues and such dues shall cover the period from January 1 through December 31 of each year. Dues remitted after December 31 shall only cover the period until December 31 of the current year. Members whose dues are current shall be considered in good standing.

B. Lifetime and Honorary members shall not be required to remit dues.

C. Dues shall be established by the Board and listed on the Association's membership application form.

D. Where any Active, Associate, Retired or Student member does not remit dues for two (2) consecutive years, the membership shall have expired and the member's name shall be removed from the roster. Expired memberships may be renewed in accordance with Article III. Section 2.A.

Section 4. Membership Meeting Voting.

A. Only Active members in good standing shall have the right to vote.

B. All members shall have the right to make and second motions and to participate in discussion of any motion before the membership.

Section 5. Conduct.

A. All members shall be committed to the Association's mission and shall conduct themselves in accordance with the Association's Code of Ethics.

Article IV. - Officers and Duties.

Section 1. Officers shall be Active members in good standing and comprised of a President, Vice President, Secretary and Treasurer.

Section 2. Officers shall be elected and installed at the Annual School of Instruction, herein referred to as the SOI.

Section 3. Officer's terms shall be one year and officers shall serve no more than two (2) consecutive terms in the same office. The terms of the Officers shall begin at the close of the SOI and end at the close of the SOI the following year.

Article V – Districts and Directors

Section 1. District Directors shall be Active members in good standing and shall be comprised of one (1) director from each of the Association's four (4) districts as follows:

District I: Shall be the area, including all cities and towns that lie therein, created by

Continue

the counties of Augusta, Arlington, Clark, Culpeper, Fairfax, Fauquier, Frederick, Greene, Highland, Loudoun, Madison, Orange, Page, Prince William, Rappahannock, Rockingham, Shenandoah, Spotsylvania, Stafford, and Warren.

District II: Shall be the area, including all cities and towns that lie therein, created by the counties of Alleghany, Amherst, Appomattox, Bath, Bedford, Bland, Botetourt, Buchanan, Campbell, Carroll, Craig, Dickenson, Floyd, Franklin, Giles, Grayson, Henry, Lee, Montgomery, Patrick, Pittsylvania, Pulaski, Roanoke, Rockbridge, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.

District III: Shall be the area, including all cities and towns that lie therein, created by the counties of Albemarle, Amelia, Brunswick, Buckingham, Caroline, Charlotte, Chesterfield, Cumberland, Dinwiddie, Fluvanna, Goochland, Greensville, Halifax, Hanover, Henrico, King George, Louisa, Lunenburg, Mecklenburg, Nelson, Nottoway, Powhatan, Prince Edward, Prince George, Surry and Sussex.

District IV: Shall be the area, including all cities and towns that lie therein, created by the counties of Accomack, Charles City, Essex, Gloucester, Isle of Wight, James City, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northampton, Northumberland, Richmond, Southampton, Suffolk, Westmoreland, and York.

Section 2. District Directors shall be elected and installed at the SOI. The terms of District Directors shall begin at the close of the SOI and end at the close of the SOI the following year

Article VI – Board of Directors and Duties.

Section 1. A Board of Directors is hereby established to manage the policies, business, property and affairs of the Association.

Section 2. Voting members of the Board shall be Active members in good standing and comprised of the Officers, District Directors, Immediate Past President, Executive Secretary and Chair of each standing committee.

Section 3. Non-voting, ex-officio members of the Board shall be as follows:

A. Any Association member from Virginia serving on the International Code Council Board of Directors.

B. The VPMIA representative currently serving on the Executive Council of the International Code Council Region VII.

C. The Deputy Director or his or her representative of the Division of Building and Fire Regulation at the Virginia Department of Housing and Community Development.

D. The President, or his or her representative of the Virginia Building and Code Officials Association, Virginia Fire Prevention Association, and Virginia Chapter of the International Association of Electrical Inspectors.

E. Any member of the Association, or of the Virginia Building and Code Officials Association serving as a representative on the Board for Contractors of the Virginia Department of Professional and Occupational Regulation.

ection 4. The Board shall appoint an Executive Secretary for a maximum term of five (5) years, or as otherwise approved by the Board.

ection 5. The Board shall require the Treasurer to be bonded. The amount, timeframe and terms of the bond shall be approved by the Board. The Association shall pay the bond premium and any other costs associated with the bond.

ection 6. The Board shall appoint members to fill unexpired terms or vacancies on the Board within forty five days.

ection 7. An executive session of the Board shall be conducted at the request of any member of the board, when approved by a two-thirds majority of the Board's voting members present. Only voting members of the Board and those individuals deemed necessary by the President to the purpose of the meeting are permitted to attend the executive session.

ection 8. The Board is hereby authorized to conduct business through electronic messaging, teleconference or other remote participation methods provided the quorum and voting requirements specified herein are observed. A minimum of three (3) business days notice shall be provided by the President or their designated representative prior to the meeting.

ction 9. Board members shall, upon receipt of draft Board and Membership meeting minutes, review such minutes and advise the Secretary of any suggested modifications within five (5) business days.

ction 10. Duties and responsibilities of each Board member shall be as described in the Board of Directors Job Description Policy, approved by the Board.

Article VII – Committees

ction 1. The standing committees are: Advertising/Yearbook, Auditing, Awards, Bylaws, Certification/Education, Finance, Legislative, Nominating, Plumbing /Mechanical /Fuel Gas, SOI, Time/Place, Membership and Information Technology.

ction 2. Standing Committee chairs shall be appointed by the President, unless otherwise specified in this article, within 30 days following the close of the SOI. Members of the committees shall be appointed by the chair unless otherwise specified in this article.

ction 3. The following standing committees shall be comprised of a minimum of three (3) members including the chair:

A. Advertising and Yearbook

B. Auditing

1. The Treasurer shall not serve on this committee.

C. Awards

D. By-Laws

E. Certification and Education

F. Finance

1. The Treasurer shall serve as the chair.

G. Information Technology

1. The webmaster shall serve as the chair.

H. Membership

Continue

1. The Executive Secretary shall serve as the chair.

I. Nominating

1. The Immediate Past President shall serve as the chair.

J. Plumbing/Mechanical/Fuel Gas.

K. Time and Place.

L. School of Instruction

1. The Executive Secretary shall serve on this committee.

2. The chair of the time and place committee shall serve on this committee Section 4. Legislative Committee shall be comprised of the committee chair and any member willing to serve.

Section 5. Special Ad Hoc committees shall be appointed by the President when deemed necessary by the President or the Board. The committee shall be comprised of a minimum of three (3) members and shall operate at the discretion of the Board. The committee chair will not have Board voting rights.

Article VIII – Meetings

Section 1. A minimum of two (2) membership meetings shall be held per year.

Section 2. First Membership Meeting shall be held at a time, date and location approved by the Board. The meeting shall be for the purpose of receiving reports from the Officers, District Directors, committees and for any other business that may arise. A minimum of fifteen (15) Active members present shall constitute a quorum.

Section 3. The SOI shall be held at a time, date and location approved by the Board. The date and location shall be approved a minimum of one (1) year in advance of the SOI. The SOI shall be for the purpose of conducting the Second Membership Meeting, providing educational programs, electing Officers, District Directors, receiving reports from Officers, District Directors, committees and for any other business that may arise. A minimum of fifteen (15) Active members present shall constitute a quorum.

Section 4. Meetings of the Board shall be held on the call of the President, but not less than three (3) times each year. A majority of the Board's voting members shall constitute a quorum.

Section 5. Special membership or Board meetings may be called by the President or the Board of Directors. Official notice of the meeting shall be sent by mail or electronically to the members a minimum of fourteen (14) days prior to the date thereof. The purpose of the meeting is to conduct business of the Association. A minimum of fifteen (15) active members present constitute a quorum for a special membership meeting or a majority of the Boards voting members for a Board meeting. Special meetings may be conducted using electronic messaging or teleconference.

Article IX – Parliamentary Authority

The current edition of *Robert's Rules of Order Newly Revised* is the Associations final Authority on all questions of procedure and parliamentary law not covered by the Constitution and By-laws nor by any special rules of order adopted by the Association.

Article X – Amendment of Bylaws

These bylaws may be amended during any membership meeting by a two-thirds majority of Active members present and voting, provided such amendment has been submitted in writing by any member to the Bylaws Chair not less than thirty (30) days in advance of a Board meeting for review and recommendation; and further provided such amendment has been posted on the Association's website not less than thirty (30) days prior to the membership meeting.

Article XI- Code of Ethics

We the members of the Association acknowledge that our profession has a direct and vital impact on the quality of life of all Virginia citizens and of all others who may live, work, play, and visit within the Commonwealth. *We the members* are therefore dedicated to the highest standards of professionalism, integrity, and competence, and we do pledge to adhere to the following principles of ethical behavior:

- Recognize that the health, safety, and welfare of the public are our top priorities and acknowledge that the primary function of government is to serve the best interests of the people.
- Consider our profession a distinct opportunity to serve society.
- Demonstrate honesty, integrity, and uniformity in the discharge of our duties.
- Treat all persons with courtesy and respect.
- Conduct ourselves in a manner which creates and maintains respect for the Association and the industry it represents.
- Refuse to leverage our positions to secure advantage or favor for ourselves, our family, or friends.
- Refrain from representing private interests in any business or affairs of the Association.
- Remain loyal to the Virginia Plumbing and Mechanical Inspectors Association and pursue its mission and objectives in a manner consistent with the public good.

* Bylaws were completely rewritten and adopted on July 25, 2014
** Bylaws were amended on 07/26/2024 to include fiscal year

A2L HVAC System Installation Checklist

This article is taken from the March 2025 Edition of *The Code Authority newsletter.*

https://www.ul.com/thecodeauthority/knowledge/hvac-system-installation-and-inspectionsupport-checklists

UL Solutions created two checklists to help support the safe installation and inspection of HVAC systems containing A2L refrigerants.

Residential Code – A2L HVAC system installation and inspection checklist
Mechanical Code – A2L HVAC system installation and inspection checklist

These checklists are not intended to be a substitute for the manufacturer's installation instructions, engineering design documents or the locally adopted codes. Rather, these checklists are to be used as educational tools and to assist installers and inspectors in navigating the detailed information found in those official documents. All code interpretations and installations are subject to approval by the Building Code Official or Authority Having Jurisdiction (AHJ) responsible for determining compliance with the applicable codes.

Both checklists are based on product features, markings and instructions that are specified by UL 60335-2-40, the Standard for Household and Similar Electrical Appliances – Safety – Part 2- 40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers (4th Edition), as well as the relevant model codes.

The first checklist covers installations per the *International Residential Code (IRC-2024). The IRC primarily relies on the product certification in accordance with UL 60335-2-40 along with the manufacturer's installation instructions.*

The second checklist addresses installations per the *International Mechanical Code (IMC-2024) or Uniform Mechanical Code (UMC-2024), both of which require certification in accordance with UL 60335-2-40 as well as installation per ASHRAE 15-2022 Safety Standard for Refrigeration Systems.*

This checklist addresses typical applications and does not address scenarios such as machinery rooms, data centers or refrigeration.

For more information related to these products or their certifications, please contact: Chris Mobley, UL Solutions lead regulatory engineer, Chris.Mobley@UL.com

Continue

A2L HVAC System Installation Checklist – International Residential Code (IRC-2024)[1]

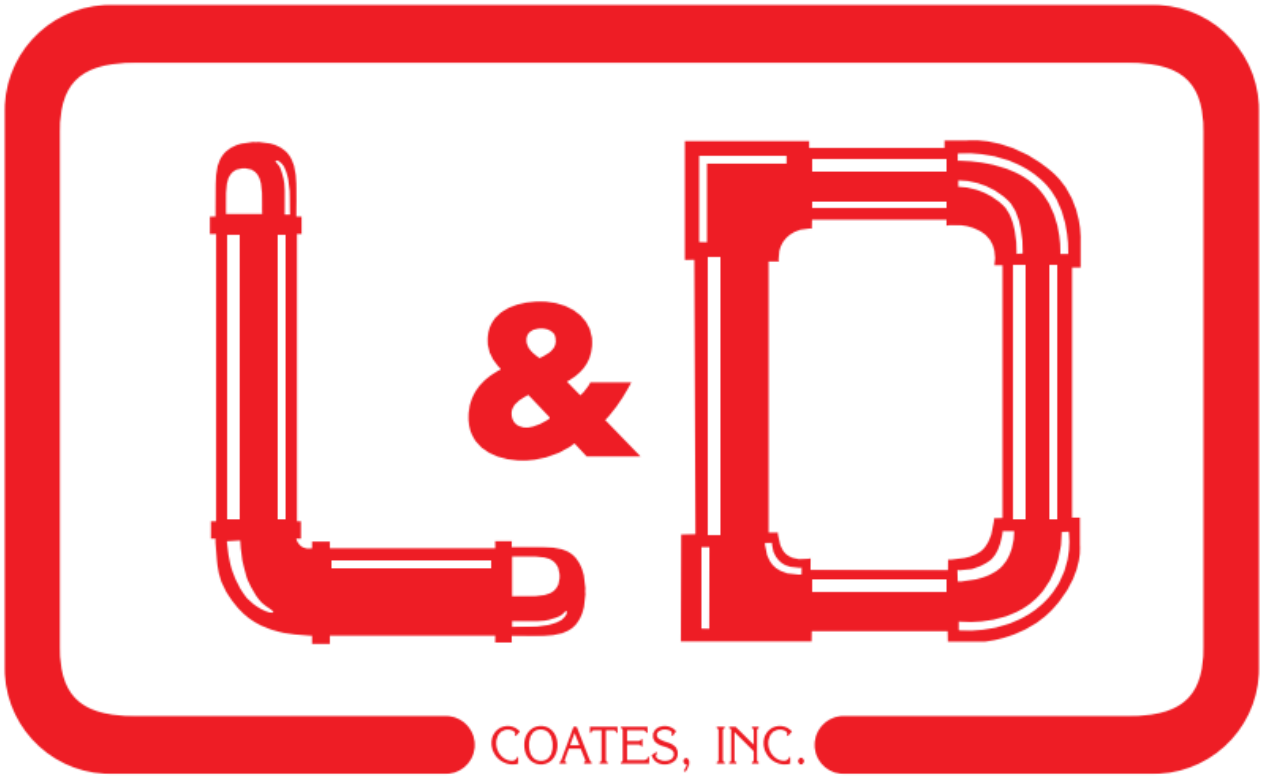
Notes	Description	Comments
	Integral Refrigerant Detection System (RDS)	
2	Is integral RDS required to be installed? (see manufacturer's installation instructions)	
	Is the correct part number RDS installed? (RDS may be shipped separately)	
3	Are sensors in the correct location? (may change based on air handler orientation)	
	Is RDS wiring connected per manufacturer's wiring diagram?	
	Room Size / Charge Limits	
2	For ducted systems (no zoning system) – Is total room area connected by duct system greater than minimum room size requirement?	
2	For ducted systems (with zoning system) – Is either: • Smallest zone greater than minimum room size requirement or • Zoning system configured to open all zones if RDS detects a leak?	
4	For non-ducted systems (room units or wall-hung units): Is room size greater than minimum room size requirement?	
5	Refrigerant charge less than 34.5 lbs per independent system?	
	Internal Sources of Ignition	
	Field installed auxiliary electric heaters – Is heater kit model identified on nameplate?	
	All electrical components inside enclosure shown on manufacturer's wiring diagram?	
	Duct-mounted Sources of Ignition	
6	Identified by equipment manufacturer's instructions? (e.g., electrostatic air cleaners, UV-C devices)	
6	No electric heating elements, open flames or devices switching electrical loads greater than 2.5kVA?	
7	Potential duct mounted ignition sources interlocked with airflow (minimum 200 ft/min. face velocity) or de-energized if RDS detects leak?	
	Additional Mitigation Controls	
8	Does the manufacturer specify installation of Safety Shutoff Valves?	
	Refrigerant Piping	
9, 10	Installed and protected per manufacturer's instructions?	
9, 10	Pressure and leak tested per manufacturer's instructions?	
	Press-connect fittings certified for use with A2L refrigerants?	
	Markings, Instructions, and Signage	
11	Refrigerant type and field adjusted charge recorded on unit label?	
11	Contact information for responsible company that installed system?	
12	Installation instructions, service manuals and product literature available for inspection?	

Notes

1. The International Residential Code (IRC-2024) M1411.2 requires HVAC appliances containing A2L refrigerants be certified to UL 60335-2-40 and installed in accordance with the manufacturer's installation instructions. This checklist is based on the most typical instructions required by UL 60335-2-40. Always refer to the instructions provided with the system. The IRC also specifies installation per the locally adopted electrical and fuel gas codes.
2. RDS and minimum room sizes are typically required for HVAC appliances with over an approximate 2-pound charge for nonfixed factory-sealed equipment or an approximate 4-pound charge for other types of equipment.
3. A2L refrigerants are heavier than air. Sensors will typically be located near the bottom of the enclosure below the evaporator coil.
4. Mounting height typically measured from bottom of wall hung unit. For wall hung units, minimum room size requirement may change based on mounting height. Rooms on the same floor can be considered if there is a connecting passageway that is a permanent opening, extending to floor that is intended for people to walk thorough.
5. IRC M1411.6
6. IRC M1411.4
7. Typical values based on UL 60335-2-40 requirements.
8. Most typical for units with multiple indoor evaporator coils. Installation may be optional to reduce releasable charge and minimum room size requirements.
9. IRC M1411.7, M1411.13, M1411.14
10. For best practices, refer to ASHRAE 15.2
11. IRC M1411.5
12. IRC M1411.3

Rev: 03/2025
2339557

PLUMBING PROFESSIONALS



COMMERCIAL • RESIDENTIAL

540-948-6230

PROUD PHCC MEMBER

A2L HVAC System Installation Checklist – International Mechanical Code (IMC-2024), Uniform Mechanical Code (UMC-2024)[1,2]

Notes	Description	Comments
	Engineering System Design	
3	Is system design per requirements of ASHRAE 15 and selected mechanical code?	
	Leak Detection: Integral Refrigerant Detection System (RDS) / Non-Integral Refrigerant Leak Detection	
4	Is integral RDS required to be installed? (see manufacturer's installation instructions)	
	Is the correct part number RDS installed? (RDS may be shipped separately)	
5	Are sensors in correct location? (may change based on air handler orientation)	
6	Is RDS wiring connected per manufacturer's wiring diagram and design?	
	Does design require refrigerant leak detection in the occupied space, non-occupied spaces, or piping shaft?	
	Room Size / Effective Dispersal Volume Charge (EDVC) / Charge Limits	
4,7,8,9	Is the effective volume into which refrigerant may leak or be dispersed adequate for the releasable charge in each space based on the minimum room size requirements of the product certification and/or the EDVC calculation per the design?	
	Internal Sources of Ignition	
	Field installed auxiliary electric heaters – Is heater kit model identified on nameplate?	
	All electrical components inside enclosure shown on manufacturer's wiring diagram?	
	Duct-mounted Sources of Ignition	
	Identified by equipment manufacturer's instructions? (e.g., electrostatic air cleaners, UV-C devices)	
10	No open flames or unclassified electrical devices in ductwork?	
10	No hot surfaces exceeding 1290°F unless interlocked with airflow with minimum 200 ft/min. face velocity?	
	Additional Mitigation Controls	
11	Does the manufacturer and design specify installation of Safety Shutoff Valves?	
	Does the manufacturer and design specify installation of pumpdown controllers?	
	Does the design specify mechanical ventilation?	
	Additional Installation and Inspection Considerations	
12	Pressure-limiting devices/Relief Valves/Discharge Piping per manufacturer's instructions and design? Clearances maintained from pressure relief discharge to building openings and intakes?	
13	Stop Valves per manufacturer's instructions and design?	
14	Code-specific requirements for equipment not in a machinery room: IMC only: Do rooms containing more than 6.6 pounds of refrigerant, meet restrictions on hot surfaces and open flames? UMC only: Do rooms containing condensing units meet ventilation requirements?	
15	Maintenance and inspection plan in place for critical systems?	
	Refrigerant Piping	
16	Piping materials, joints, and connections as specified? Press-connect fittings certified for use with A2L refrigerants?	
17	Piping not in prohibited locations? Piping and penetrations protected as specified?	
18	Shaft enclosures and ventilation as specified?	
19	Piping pressure and vacuum tested as specified?	
20	Pipe identification: "WARNING – Risk of Fire. Flammable Refrigerant"?	
	Markings, Instructions, and Signage	
21	Refrigerant type, field adjusted charge, lubricant and field test pressure recorded on unit signage?	
21	Name and address for responsible company that installed system?	
	Installation instructions, service manuals and product literature available for inspection?	

Rev: 03/2025

Continue

HOPKINS | LACY
A BRANCH COMPANY

WE'RE YOUR METAL FABRICATOR

WE SPECIALIZE IN ALL TYPES OF COMMERCIAL METAL FABRICATION AND PREFABRICATION, FROM CUSTOM HVAC DUCT TO MECHANICAL & PLUMBING PIPING TO SPECIALTY AND CUSTOM METAL WORKS.

CAPABILITIES

- FULL COIL LINE
- SQUARE DUCT
- VULCAN WATERJET INSULATION CUTTING
- DUST-FREE PIPING AND STEEL MANUFACTURING AREAS
- MISCELLANEOUS METALS
- CUSTOM METAL WORK
- PNEUMATIC CUTTING
- ORBITAL WELDING
- WELDING (ALL TYPES OF COMMERCIAL WIRE, STEEL, ALUMINUM)
- IN-HOUSE ENGINEERING & BIM

SERVING THE MID-ATLANTIC

CONTACT: CHAD BUCK · 540-797-8356 · CHAD.BUCK@GJHOPKINS.COM

Notes

1. This checklist covers typical HVAC applications. It does not include machinery rooms, ITE applications or refrigeration This checklist is not intended to be a substitute for the manufacturer's installation instructions, engineering design documents or the locally adopted codes. The intent of these checklists is to be used as educational tools and assist installers and inspectors in navigating the detailed information found in those official documents.
2. The International Mechanical Code (IMC-2024) 1101.2 and Uniform Mechanical Code (UMC-2024) 1104.6.2.2 require HVAC appliances containing A2L refrigerants be certified in accordance with UL 60335-2-40 and installed in accordance with the manufacturer's installation instructions. This checklist is based on the most typical instructions required by UL 60335-2-40. Always refer to the instructions provided with the system. These mechanical codes also specify installation per the locally adopted electrical and fuel gas codes.
3. IMC 1101.1.1 and UMC 1102.1 require system design per ASHRAE 15-2022 as modified and supplemented by the adopted mechanical code.
4. RDS and minimum room sizes are typically required for HVAC appliances with over an approximate 2-pound charge for nonfixed factory-sealed equipment, or an approximate 4-pound charge for other types of equipment.
5. A2L refrigerants are heavier than air. Sensors will typically be located near the bottom of the enclosure below the evaporator coil.
6. ASHRAE 15 7.6.2.5 and UMC 1104.6.2.4 specify mitigation actions upon leak detection by RDS.
7. IMC Section 1104, UMC Section 1104, ASHRAE 15 Section 7, see Figure 7-1
8. ASHRAE 15 EDVC calculations are based on occupancy classification (e.g., commercial, institutional), system location (e.g., outdoors, in public corridors and lobbies) and system configuration and mitigations. If the EDVC exceeds the releasable charge for the Effective Dispersal Volume, the system charge is not in compliance and additional mitigation, or a machinery room may be required.
9. Minimum room size markings per product certification to UL 60335-2-40 provide requirements for basic installations using conservative assumptions. Engineering design using EDVC calculations per ASHRAE 15 can account for more complex installations and actual site conditions. In some cases (e.g., charges 6.6. lbs. or less) ASHRAE 15 does not apply restrictions, but in these cases requirements of the product certification still apply.
10. ASHRAE 15 7.6.3 and UMC 1104.6.3. Duct Heaters certified to UL 1996 with hot spot temperatures less than 1290°F shall be so marked.
11. ASHRAE 15 7.3.4.3, 7.3.4.4. Most typical for units with multiple indoor evaporator coils. Installation may be optional to reduce releasable charge and minimum room size requirements.
12. UMC Sections 1111-1112, ASHRAE 15 9.4-9.9 If pressure relief devices are provided as part of certified systems, they correlate with the pressure coordination requirements of ASHRAE 15 9.9.1.
13. IMC 1109.6, UMC Section 1110, ASHRAE 15 9.10, 9.11
14. IMC 1104.3.4, UMC 1105.5
15. IMC Section 1111, UMC Section 1118, ASHRAE 15 10.5, International Fire Code (IFC-2024) Section 608, NFPA 1-2024 Fire Code Chapter 53.
16. IMC Sections 1107-1108, UMC Section 1109, ASHRAE 15 9.12.5
17. IMC Section 1109, UMC Section 1109, ASHRAE 15 9.12
18. 18) IMC 1109.2.5, 1109.3.2, UMC 1109.3, ASHRAE 15 9.12.1.5
19. IMC Section 1110, UMC Section 1116, ASHRAE 15 9.13. Certificate of test required over 55 lbs.
20. IMC 1109.2.7, ASHRAE 15 9.12.1.8
21. ASHRAE 15 10.1.1

Rev: 03/2025
2339557

DuRa™ Pipe

DURAPIPE™

THE RELIABLE CHOICE

Epoxy Coated Cast Iron Soil Pipe & Fittings for Aggressive Applications

AB&I Foundry · anaco-husky · TYLER · McWane Plumbing Technical Services

VPMIA's Foundation

Vision Statement

VPMIA members are committed to providing code development leadership and continuous training that results in uniform application of the codes. We look for opportunities to partner with all who are impacted and strive to develop and deliver codes and standards that result in health, safety, and welfare protection for the public.

Mission

VPMIA is an association of code professionals dedicated to promotion of uniform enforcement and development of the codes throughout the Commonwealth to assure the health, safety, and welfare of its citizens and any one who may live, work, or visit the state of Virginia. The pursuit of this endeavor is achieved through close, open, and equal working relationships with design professionals, builders, contractors, material manufacturer's and others involved in the construction industry. VPMIA supports the ICC, its goals and mission.

Strategic Plan Mission

VPMIA's strategic plan is to advance our mission through training in order to promote better understanding of the benefits and efficiency of using model codes. The association promotes teamwork, while embracing fairness and respect to all involved parties, always maintaining open communications in every aspect to those who participate in the process.

VPMIA's Strategic Plan

GOAL # 1

Enhance and increase communications of VPMIA with the public
(Communications)
Initiative action:

- Actively promote a positive image of code enforcement's role in the community.
- Advertisements in trade, industry, state DHCD, and community publications.
- Commitment to code development to achieve the superior level of health, safety, and welfare for our citizens.

GOAL # 2

Increase and expand education
(Training –Communications)
Initiative action:

- Encourage increased participation from all interested parties who interact with any and all aspects of code enforcement.
- Increase awareness of the educational benefits of the association.
- Promote credentialing programs provided by the state DHCD.

GOAL # 3

Uphold the highest levels of professionalism
(Leadership – Professionalism)
Initiative action:

- Instill and promote leadership values.
- Always display integrity.
- Adherence to code of ethics.
- Share knowledge at all levels.
- Maintain and promote certifications.
- Respect others.

GOAL # 4

Promote relationships with industry and related professional organizations
(Cooperation)
Initiative action:

- Participate in the code development process.
- Encourage cooperative working relationships with construction-industry professionals.
- Become involved as active or associate members to other professional organizations such as VBCOA, ICC, IAEI, and PMPV.
- Solicit speakers and provide speakers for these organizations to enhance communication.
- Continue to actively participate in DHCD towards uniform application and development of the model building codes and standards.

GOAL # 5

Broaden and expand VPMIA Membership (Membership)
Initiative action:

- Develop information package of the organization benefits.
- Provide more member services.
- Develop a more wide spread advertisement program for membership, including associate members.

GOAL # 6

Continue leadership and participation in code development process
(Leadership – Code Development)
Initiative action:

- Enhance and develop strategies for participation in International Code Council Code developmental process.
- Encourage participation on state and national committees.
- Provide financial support towards member participation in these activities.

GOAL # 7

Promote the adoption of the International Code Council family of model codes (Communications – Training)
Initiative action:

- Provide analysis and impact of benefits for industry, where necessary.
- Provide training for code enforcement officials and industry.
- Interact with DHCD to provide uniform enforcement of model codes.

GOAL # 8

Ensuring financial viability of VPMIA
Initiative action:

- Align financial resources to organizational outcomes.
- Achieve goal objectives.
- Operate within budgeted plan.

Atomic Plumbing Supports VPMIA

ATOMIC

Call Us For ALL Your Plumbing Needs!

PLUMBING & DRAIN CLEANING

757-464-2934

Jim Steinle, Owner

www.atomicplumbing.com

VIRGINIA 2021 CODE COMPLIANT INSTALL

2021 VIRGINIA Energy Code Commercial & Residential

Air Barrier: New Penetration Sealing Requirement

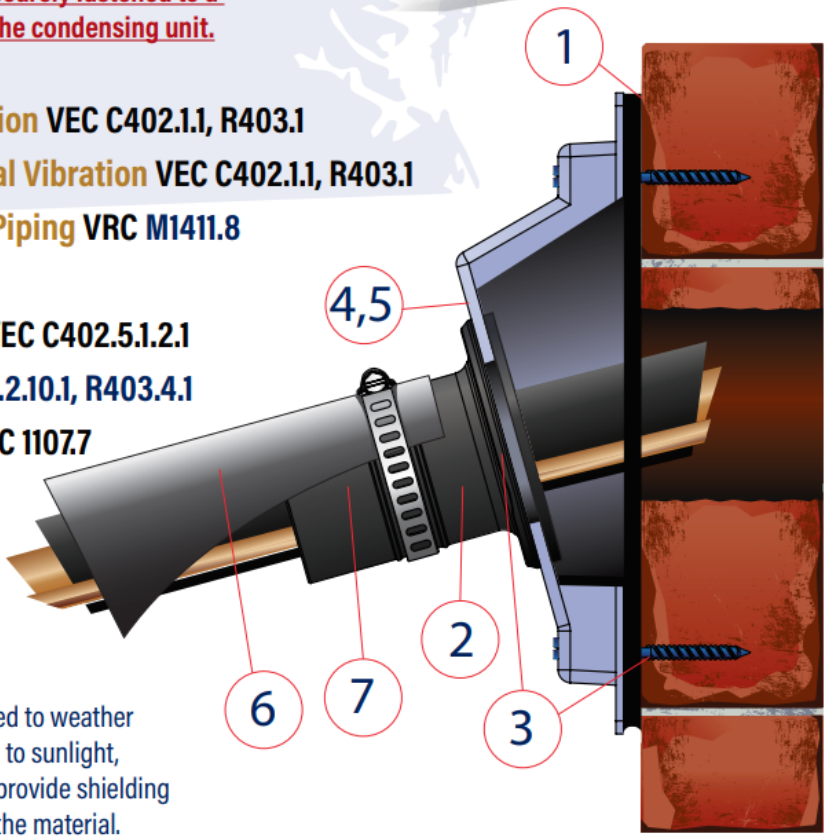
C402.5.1.1, R402.4.1.1 - Penetrations of the air barrier shall be caulked, gasketed or otherwise sealed in a manner compatible with the construction materials and location.
Sealing shall allow for expansion, contraction, and mechanical vibration.

2021 VIRGINIA Residential Code

Support of Refrigerant Piping.

M1411.8 Refrigerant piping and tubing shall be securely fastened to a permanent support withing 6 feet (1829mm) of the condensing unit.

1. Gasket Allows Expansion & Contraction **VEC C402.1.1, R403.1**
2. Sleeve Isolates Pipe from Mechanical Vibration **VEC C402.1.1, R403.1**
3. Permanent Support for Refrigerant Piping **VRC M1411.8**
4. Rodentproofing **VBC Appendix F**
5. ASTM E2178 Air Barrier Permeance **VEC C402.5.1.2.1**
6. Pipe Insulation Protection **VEC C403.2.10.1, R403.4.1**
7. Removable for Visual Inspection **VMC 1107.7**



2021 VIRGINIA Energy Code

Piping Insulation Protection

IECC C403.2.10.1, R403.4.1 : Piping insulation exposed to weather shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, wind and shall provide shielding from solar radiation that can cause degradation of the material.
Adhesive tape shall not be permitted.

Removable & Reusable to comply with mechanical code visual inspection of refrigerant pipe joints requirement

EFLEXGUARD™
HVAC Insulation Protectors

10 YEAR WARRANTY

25 Years of
Superior Protection

MADE IN USA

AIREX TITANOUTLET™

ASTM 283 for Air Leakage,
ASTM E331 for Water Penetration

AIREX
Manufacturing Inc.

www.airexmfg.com

(760)343-2277

ICC INTERNATIONAL CODE COUNCIL®

Advance your code knowledge and career

Count on the technical expertise of the Code Council, your premier provider of construction codes and standards

1 FULL-SERVICE SHOP

- **Prep for exams** with Study Companions and FlashCards
- **Learn new requirements fast** with Significant Changes guides
- Gain **expert insight** with the Code & Commentary series
- Download **FREE CodeNotes™** quick-reference tools for CSST gas piping, Manual J, worker safety, solar water heating systems and more

2 EARN CEUS

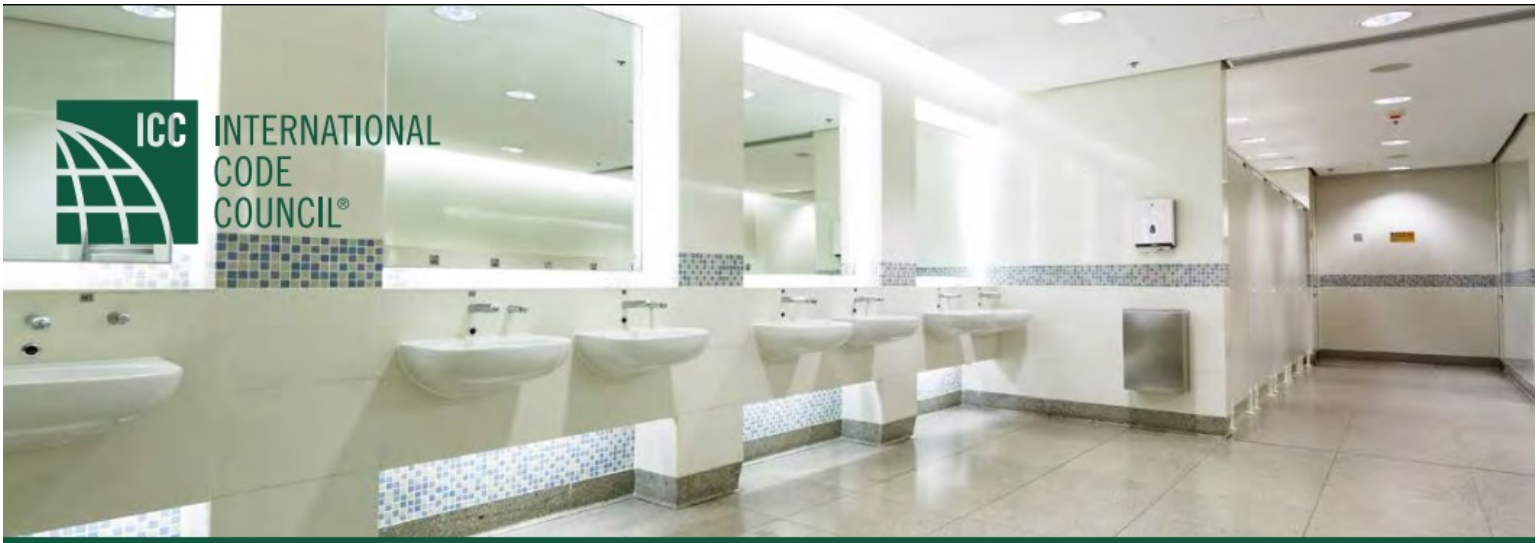
ICC Training delivers high quality training and an extensive course list covering a variety of codes and standards. Choose from **in-person, online live and online self-paced**. Browse our Credential of Learning Achievements (CLA).

3 GET CERTIFIED FROM HOME

The Code Council offers **the most credible, fair and reliable** examination program. PRONTO, a remote proctored testing system, allows candidates to test from any secure location with highspeed internet access or at one of over 500+ test centers.

1-888-ICC-SAFE (422-7233) | www.iccsafe.org

25-24769



International Plumbing Code®:

Providing Options for Designers of Modern Public Restrooms

The International Plumbing Code (IPC®) was the first code developed with the full cooperation of the three model code groups: Building Officials and Code Administrators International, Inc. (BOCA), International Conference of Building Officials (ICBO), and Southern Building Code Congress International, Inc. (SBCCI). The intent was to regulate plumbing with the most technically accurate code. The original intent of the IPC was to recognize all acceptable methods of construction for various plumbing systems. The code did not attempt to arbitrarily restrict any method, material, concept or system. Since its initial development, the IPC has been updated through its code development process, with participation from widely recognized experts.

Privacy Has Always Been Part of the IPC

From its inception, the IPC has prioritized privacy for occupants of public restrooms. In fact, the original 2000 edition of the IPC included a section requiring a separate compartment with walls or partitions and a door for each water closet in a public restroom to ensure privacy. In the 2006 edition these provisions for privacy were extended, with the addition of a section requiring a separate area with walls or partitions to provide privacy for each urinal in a public restroom. This section also identified dimensions of the partition.

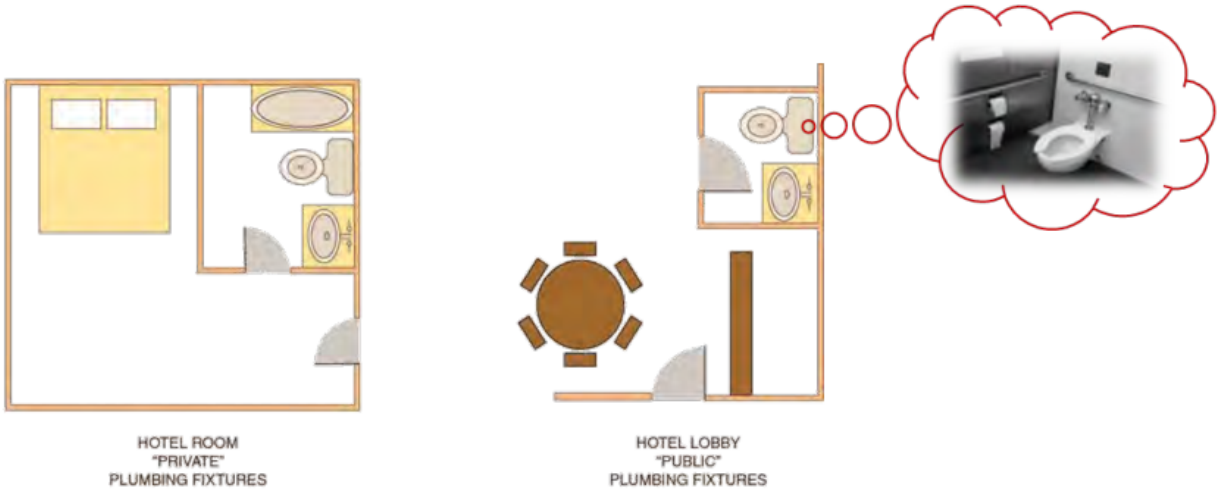
A code section was introduced in the 2012 edition of the IPC to address concerns about maintaining appropriate behavior inside of public restrooms. The doors of multiple-occupant restrooms are prohibited from being locked from the inside of the room. Restricting the egress door in this way reduces the possibility of inappropriate activities that are more likely to occur when an occupant can restrict entry to the room.

Subsequent editions of the codes, up to and including the 2021 IPC and International Building Code (IBC®), continued to offer a toolbox of practical and safe solutions for the design community—here are a few examples.

Clear Definitions of Public and Private Restrooms

Codes, by their very nature, are technical documents. Every word, term and punctuation mark can change the meaning of a technical requirement. The definitions of public and private were modified to clarify between "public or public utilization restrooms" and "private restrooms." This was especially helpful when dealing with the classification of plumbing fixtures. There is now a clear distinction as to which plumbing fixtures are intended to be configured for public use. The definition of "public" has gone from applying to fixtures within a specified list of occupancy types, to applying to fixtures in any occupancy type having unrestricted exposure to walk-in traffic. The definition of "private" has undergone a similar change and simply applies to fixtures that are not public.

Continue



Example of public and private restrooms

New Fixture Calculations for Better Accessibility

The regulations in Section 403.1.1 of the 2021 IPC, covering fixture calculations, have remained unchanged except for the addition of one important exception. The new Exception 2 offers a different way to design facilities that can be used by all genders. Such multiple-user facilities are available for any person to use, regardless of sex or gender. Where multiple-user facilities are designed in this manner, the minimum fixture count is calculated at 100%, based on the total occupant load of the building.

This requirement overrides the base section requirement for dividing the total occupant load in half (assuming a 50-50 male/female distribution) when applying the fixture ratios of Table 403.1. The calculations are straight forward where the male and female fixture ratios in Table 403.1 are identical. However, where different table ratios are indicated, the calculations will require adjustment to accommodate the difference. When using this method, all fixtures required to be accessible must comply with the applicable provisions of standard ICC A117.1 (Accessible and Usable Buildings and Facilities) and each urinal must be in a stall that provides privacy in accordance with Section 405.3.5.

In 2018, code provisions were added to the IPC (Section 403.1.2) and IBC to allow toilet fixtures located in a single-user toilet facility to be counted toward the total number of fixtures required for an occupancy, despite their designation by sex or family. In 2021, Section 403.1.1 Exception 3 was added to clarify how toilet facilities that are configured to allow use by either sex can also be used. Where a building is designed to have single-user toilet facilities, and the male and female fixture ratios in Table 403.1 are identical, the distribution of sexes is not required. However, where different table ratios are indicated, the calculations will require adjustment to accommodate the difference. This is basically saying that the intent of these changes is not to reduce the total quantity of plumbing fixtures required for a building.

Photo of a typical multiple lavatory rough-in

Continue

Proud to support the VPMIA

434-295-1177
Charlottesville, Virginia

webrown.com

Fixtures in single-user toilet rooms count towards total required quantities

Section 403.1.2 was modified in the 2018 edition of the IPC such that the number of plumbing fixtures in all single-user toilet and bathing rooms count towards the total quantity required for a building. Language was added stating that the required number of plumbing fixtures for a building or space can be located in single-user facilities, separate facilities or a combination thereof. In the 2021 edition of the IPC, the language was modified further.

The text now reads:

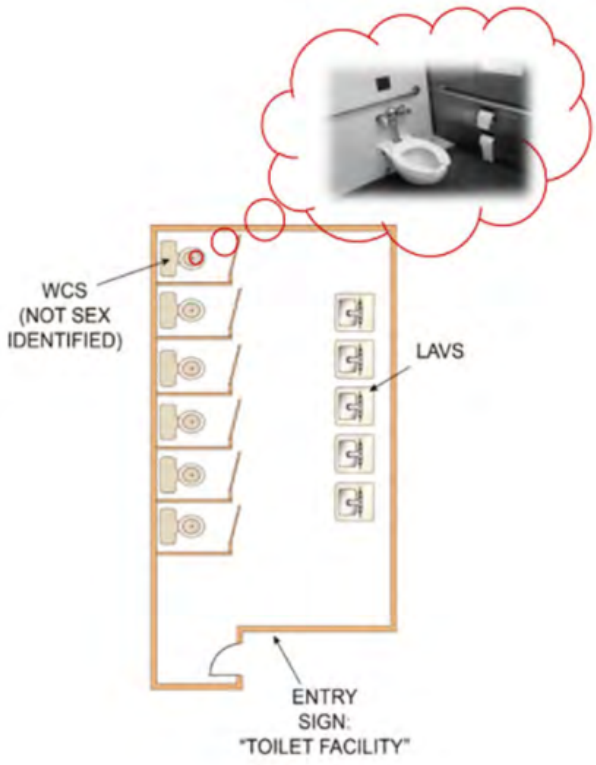
403.1.2 Single-user toilet and bathing room fixtures. *The plumbing fixtures located in single-user toilet and bathing rooms, including family or assisted-use toilet and bathing rooms that are required by Section 1109.2.1 of the International Building Code, shall contribute toward the total number of required plumbing fixtures for a building or tenant space. Single-user toilet and bathing rooms, and family or assisted-use toilet rooms and bathing rooms shall be identified as being available for use by all persons regardless of their sex.*

The total number of fixtures shall be permitted to be based on the required number of separate facilities or based on the aggregate of any combination of single-user or separate facilities.

Given that single user facilities can serve all persons, the number of plumbing fixtures in those rooms can count towards the total number of fixtures required for a building. In this case, single user facilities must be identified as being available for use by all persons, regardless of their sex or gender.

Multiple-user Non-separated Toilet Facilities

Toilet facilities designed for multiple users regardless of sex or gender are now possible with the addition of two new exceptions to Section 403.2 covering separate facilities. Exception 5 provides an allowance that single-user toilet rooms not be designated by sex. Exception 6 introduces the new concept of multiple-user toilet facilities designed to serve all sexes and genders, like the new concept introduced in Section 403.1.1.



Example of a Multiple-user toilet facility for all sexes and genders

Continue

PC Development Process is Based on Consensus and Transparency

The Code Council is committed to building consensus on the changes made to its family of codes (I-Codes®). The code development process used to facilitate changes was developed to be open, balanced, transparent and inclusive, with built-in safeguards to ensure that no single group or individual's interests can dominate or sway any outcomes. Through this process, the IPC and all other I-Codes continue to be the world's standard for safety and integrity.

Jim Cika is a director, PMG technical resources for the International Code Council, where he serves as a subject matter expert to the plumbing, mechanical, fuel gas, and swimming pool & spa codes. He represents ICC in federal and state coalitions, task forces, committees, and councils where expertise in PMG technical matters is required. Cika has a degree in Mechanical Engineering from the Georgia Institute of Technology, and started his career as an HVAC design consultant. In addition, he has over 20 years of experience as a chief engineer responsible for regulatory, product standards, building code and product engineering matters for manufacturers of water heating and space heating appliances.

Charles Lee Clifton, retired senior director of plumbing, mechanical and fuel gas resources for the International Code Council, has more than 45 years of experience in the plumbing, mechanical and fuel gas industry. His career began as a second-generation plumber, working for his father at Clifton Plumbing Inc., in Tampa, Fla. He retired from the city of Los Angeles in 2007 as a principal inspector after 21 years of service. He retired from the International Code Council after 13 years of service.

Manufacturers Representative Since 1968

Harry Eklof & Associates, Inc.

Main Office & Distribution Center
3401 Pennsy Dr. Landover, MD 20785

Main line: 1 (800) 556-7556
(301) 772-1700 | Fax (301) 772-7347

MARYLAND, VIRGINIA, DELAWARE, & WASHINGTON, DC PLUMBING & MECHANICAL PRODUCTS
PIPE | VALVES | FITTINGS | CEMENTS | TOOLS

www.akindustries.com

Polyethylene & Fiberglass Basins, Covers & Accessories

www.brenelle.com

The professional choice for soldering with water still in the line.

www.bow-group.com

FlowGuard Gold CPVC CTS Pipe & Fittings, Temp Rite Super Pex

www.caleffi.com

Innovative plumbing & heating valves for the plumbing & Hydronic markets

www.cimberiovalve.com

Ball, Gas, Press & Push Specialty Plumbing & Heating Valves

www.dewalt.com

Power tools & Accessories for the Mechanical Electrical and Plumbing markets

www.elkhartproducts.com

Wrot and Cast Copper fittings for the Plumbing and HVAC

www.ipscorp.com

Home Water Leak Detection System

www.florestone.com

Shower Bases & Mop Receptors, Utility Sinks, Terrazzo Bases & Mop Basins, FRP ADA Tubs & Showers

www.harrisproductsgroup.com

Solders, Brazing Rods, Accessories, Torches, and Gases (Map-Pro & Propane).

www.ipsplumbingproducts.com

Weld-On Primers & Cements, Water-Tite Specialty Products, Test-Tite Test Plugs, Guy Gray Boxes, Truebro Lav Protection, AB&A Drains, Studor Resi. & Engineered Commercial Air Admittance Valves

Irwintools.com

Hand tools & Power Accessories

www.kflex.com

Polyethylene & rubber pipe installation

www.cutwithlenox.com

Power Tool Accessories & Hand Tools: Recip Blades, Jigsaw Blades, Hole, Hacksaws, & PBV Saws, Step Drill Bits, Wood Boring Bits, Ship Auger Bits, Utility Knives, Tubing Cutters

www.metalproducts.com

Products for the plumbing, electrical & building industries. Stud Gaurds, Boca, Plates, Straps, and Plumbers tape

www.navieninc.com

Condensing Tankless Gas Water Heaters & Boilers

www.nvent.com

Strut, Pipe Hangers, Equipment & pipe Support & Accessories

www.pentair.com

Myers Sump, Sewage, Effluent & Grinders Products

www.rehau.com

PEXa Pipe, Fittings and Accessories

www.wardmfg.com

Malleable Fittings, Cast Iron Fittings & Nipples (Domestic & International), Wardflex CSST Tubing

www.westlakepipe.com

PVC Solvent Weld & Gasket Sewer Fittings, Lg. Diameter DWV Fittings Sch 40, Sch 80 PVC, Foam Core, Sewer & Drain, SDR 21/26/35 Sch 40 PVC, Sch 80 PVC/CPVC, DWV Fittings, Colonial PVC Valves

Richmond, VA Office
3001 Impala Place, Richmond, VA 23228
(804) 266-0079 | Fax (804) 266-0280

Moorestown, NJ Office & Distribution Center
1272 North Church Street, Moorestown, NJ 08057
(856) 439-9801 | Fax (856)-439-9799