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**VIRTUAL/TELECONFERENCE  
COMMERCIAL BUILDING CODE COUNCIL  
4822 Madison Yards Way, Virtual, Madison  
Contact: Christine Poleski (608) 266-2112  
March 8, 2021**

*The following agenda describes the issues that the Council plans to consider at the meeting. At the time of the meeting, items may be removed from the agenda. Please consult the meeting minutes for a record of the actions of the Council.*

**AGENDA**

**10:00 A.M.**

**OPEN SESSION – CALL TO ORDER – ROLL CALL**

- A. Adoption of Agenda (1-2)**
- B. Approval of Minutes from February 8, 2021 (3-4)**
- C. Reminders: Conflicts of Interest, Scheduling Concerns**
- D. Administrative Matters – Discussion and Consideration**
  - 1) Committee, Department and Staff Updates
  - 2) Updates on SharePoint
- E. Administrative Rules Matters – Discussion and Consideration**
  - 1) SPS Suggested Code Changes (5)
    - a. SPS 361 – Administration and Enforcement (6-10)
      - i. 361.45
      - ii. Other Possible Changes
    - b. SPS 362 – Buildings and Structures (11-13)
      - i. 362.3002(4)
      - ii. Other Possible Changes
    - c. SPS 365 – Fuel Gas Appliances (14-15)
      - i. Presentation on UL 1738 Fuel Gas Venting Systems (16-62)

**F. Public Comments**

**ADJOURNMENT**

**NEXT MEETING: APRIL 12, 2021**

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MEETINGS AND HEARINGS ARE OPEN TO THE PUBLIC, AND MAY BE CANCELLED WITHOUT NOTICE.

Times listed for meeting items are approximate and depend on the length of discussion and voting. All meetings are held at 4822 Madison Yards Way, Madison, Wisconsin, unless otherwise noted. In order to confirm a meeting or to

request a complete copy of the board's agenda, please call the listed contact person. The board may also consider materials or items filed after the transmission of this notice. Times listed for the commencement of disciplinary hearings may be changed by the examiner for the convenience of the parties. Requests for interpreters for the deaf or hard of hearing, or other accommodations, are considered upon request by contacting the Affirmative Action Officer, 608-266-2112, or the Meeting Staff at 608-266-5439.

**VIRTUAL/TELECONFERENCE  
COMMERCIAL BUILDING CODE COUNCIL  
MEETING MINUTES  
FEBRUARY 8, 2021**

**PRESENT:** Jennifer Emberson Acker, Michael Adamavich (*arrived at 10:31 a.m.*), Kevin Bierce, Steven Harms (*arrived at 10:10 a.m.*), William Hebert, Steven Howard, Richard Paur, Irina Ragozin (*arrived at 10:09 a.m.*), Brian Rinke

**EXCUSED:** Matthew Marciniak

**STAFF:** Christine Poleski, Executive Director; Jameson Whitney, Legal Counsel; Garry Krause, Safety and Buildings Bureau Director; Eric Hansen, Consultant, Building Systems-Senior; Thomas Westlund, Consultant, Building Systems-Senior; Justin Gavin, Integrated Services Section Chief; Kimberly Wood, Program Assistant-Adv.; Megan Glaeser, Bureau Assistant; and other Department Staff

**CALL TO ORDER**

Richard Paur, Chairperson, called the meeting to order at 10:00 a.m. A quorum was confirmed with six (6) members present.

**ADOPTION OF AGENDA**

**MOTION:** Richard Paur moved, seconded by Brian Rinke, to adopt the Agenda as published. Motion carried unanimously.

**APPROVAL OF MINUTES FOR DECEMBER 15, 2020**

**MOTION:** Steven Howard moved, seconded by Jennifer Emberson Acker, to approve the Minutes of December 15, 2020 as published. Motion carried unanimously.

**Election of Officers**

*Chairperson*

**NOMINATION:** Brian Rinke nominated Richard Paur for the Office of Chairperson. Richard Paur accepted the nomination.

Christine Poleski, Executive Director, called for nominations three (3) times.

Richard Paur was elected as Chairperson by unanimous voice vote.

*Vice Chairperson*

**NOMINATION:** Richard Paur nominated Brian Rinke for the Office of Vice Chairperson.  
Brian Rinke accepted the nomination.

Christine Poleski, Executive Director, called for nominations three (3) times.

Brian Rinke was elected as Vice Chairperson by unanimous voice vote.

<b>ELECTION RESULTS</b>	
<b>Chairperson</b>	Richard Paur
<b>Vice Chairperson</b>	Brian Rinke

*(Irina Ragozin arrived at 10:09 a.m.)*

*(Steven Harms arrived at 10:10 a.m.)*

*Michael Adamavich arrived at 10:31 a.m.)*

#### **ADJOURNMENT**

**MOTION:** William Hebert moved, seconded by Steven Howard, to adjourn the meeting. Motion carried unanimously.

The meeting adjourned at 12:25 p.m.

**State of Wisconsin  
Department of Safety & Professional Services**

**AGENDA REQUEST FORM**

<b>1) Name and title of person submitting the request:</b> Justin Gavin, Section Chief Commercial Buildings		<b>2) Date when request submitted:</b> 2/23/2021 <small>Items will be considered late if submitted after 12:00 p.m. on the deadline date which is 8 business days before the meeting</small>	
<b>3) Name of Board, Committee, Council, Sections:</b> Commercial Building Code Council			
<b>4) Meeting Date:</b> 3/8/2021	<b>5) Attachments:</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>6) How should the item be titled on the agenda page?</b> SPS Suggested Code Changes	
<b>7) Place Item in:</b> <input checked="" type="checkbox"/> Open Session <input type="checkbox"/> Closed Session	<b>8) Is an appearance before the Board being scheduled?</b> <i>(If yes, please complete <a href="#">Appearance Request</a> for Non-DSPS Staff)</i>  <input type="checkbox"/> Yes <input type="checkbox"/> No	<b>9) Name of Case Advisor(s), if required:</b>	
<b>10) Describe the issue and action that should be addressed:</b> Please see the attached Spreadsheet Please see attached documents for changes to SPS 361.45, SPS 362.3002 Please see attached Presentation regarding UL 1738			
<b>11) Authorization</b>			
Signature of person making this request Justin Gavin		Date	
Supervisor (if required)		Date	
Executive Director signature (indicates approval to add post agenda deadline item to agenda)			
Date			
<b>Directions for including supporting documents:</b> 1. This form should be attached to any documents submitted to the agenda. 2. Post Agenda Deadline items must be authorized by a Supervisor and the Policy Development Executive Director. 3. If necessary, provide original documents needing Board Chairperson signature to the Bureau Assistant prior to the start of a meeting.			

## PROPOSED CHANGE

### Subchapter V — Approval and Inspection of Modular Multifamily Dwellings Commercial Buildings and their Components

#### SPS 361.45 SPS 361.45 Modular multifamily dwelling commercial construction scope.

This subchapter shall govern the design, manufacture, installation, and inspection of modular commercial buildings, multifamily housing, modular multifamily building systems, and the building system components displaying the Wisconsin insignia.

SPS 361.45 History History: CR 16-094: cr., Register April 2018 No. 748 eff. 5-1-18.

#### SPS 361.46 SPS 361.46 Manufacture, sale, and installation of dwellings. commercial buildings

SPS 361.46(1)(1) MANUFACTURE AND SALE. No modular commercial building, multifamily housing, modular multifamily building system and the building system components subject to this subchapter may be manufactured for use, sold for initial use or installed in this state unless it is approved by the department and it bears the Wisconsin insignia issued in accordance with s. SPS 361.47 (6).

SPS 361.46(2) (2) COMPLIANCE ASSURANCE PROGRAM. A manufacturer of a modular commercial building, multifamily dwelling shall establish a compliance assurance program to ensure that materials, production, and site operations conform to chs. SPS 361 to 366 and approved construction documents. The compliance assurance program shall be independent from the production of the unit. The compliance assurance program shall include all of the following:

SPS 361.46(2)(a) (a) Inspection and testing procedures that include inspection and testing frequency, processes, and criteria for accepting and rejecting materials and products.

SPS 361.46(2)(b) (b) A flow chart, plant layout, or other schematic plan or document illustrating and describing the process for manufacturing modular commercial buildings, multifamily dwellings, including locations and check points where mandatory inspections will occur.

SPS 361.46(2)(c) (c) Procedures for protecting materials, supplies, and other items used in the production process from damage and deterioration.

SPS 361.46(2)(d) (d) Procedures for segregating and disposing of rejected materials and products, including a record documenting the authority to reject defective work without conflict from the production department.

SPS 361.46(2)(e) (e) Procedures for calibrating, testing, and inspecting equipment used in the production process.

SPS 361.46(2)(f) (f) Procedures for final inspection, identification, and labeling of finished modular commercial buildings, multifamily housing, modular multifamily building systems, and the building system components, including a system for issuing and maintaining records of serial numbers on units and components.

SPS 361.46(2)(g) (g) Procedures for handling, storing, and protecting all finished modular commercial buildings, multifamily housing, modular multifamily building systems, and the building system components at the manufacturing plant or other storage facility.

SPS 361.46(2)(h) (h) Procedures and methods for storing and maintaining access to manufacturing records.

SPS 361.46(2)(i) (i) An audit, monitoring, or similar evaluation system to assess the effectiveness of the compliance assurance program and the manufacturing process.

SPS 361.46(3) **(3)** INSTALLATION. The manufacturer shall obtain building plan review and approval, in accordance with this subchapter, for a modular **commercial building**, multifamily dwelling before any on-site construction within the scope of chs. SPS 361 to 366 is commenced.

SPS 361.46 History **History:** CR 16-094: cr., Register April 2018 No. 748 eff. 5-1-18.

SPS 361.47 **SPS 361.47 Approval procedures.**

SPS 361.47(1)**(1)** APPLICATION FOR APPROVAL.

SPS 361.47(1)(a)**(a)** An application for approval of any modular **commercial building**, multifamily housing, modular multifamily building system, and the building system components shall be submitted to the department on a form required by the department, along with the appropriate fees in accordance with s. SPS 302.34 (5).

SPS 361.47 Note **Note:** An application form is available from the department's Division of Industry Services website at [dps.wi.gov](http://dps.wi.gov).

SPS 361.47(1)(b) **(b)** The department shall review and make a determination on an application for approval of a modular **commercial building**, multifamily housing, modular multifamily building system, and the components of the building system within 30 days.

SPS 361.47(2) **(2)** APPROVAL OF PLANS AND SPECIFICATIONS FOR MODULAR **COMMERCIAL BUILDINGS**, MULTIFAMILY BUILDING SYSTEMS AND BUILDING SYSTEM COMPONENTS.

SPS 361.47(2)(a)**(a)** *Approval of building systems.* **Four complete sets of** Building, structural, and HVAC plans, including elevations, sections, and details, and **one set of** specifications and calculations shall be submitted to the department on behalf of the manufacturer for examination and approval.

Down

Up

SPS 361.47 Note **Note:** Plumbing plans submission criteria can be found in ch. SPS 384.

SPS 361.47(2)(b) **(b)** *Approval of building components.* **Four complete sets of** Plans and specifications for manufactured building components shall be submitted to the department on behalf of the manufacturer for examination and approval.

SPS 361.47(3) **(3)** NOTIFICATION OF APPROVAL OR DENIAL OF PLANS AND SPECIFICATIONS.

SPS 361.47(3)(a)**(a)** *Conditional approval.*

SPS 361.47(3)(a)1.**1.** 'Department review.' If the department determines that the plans, specifications, and application for approval submitted for a modular **commercial buildings**, multifamily building system or a building system component substantially conform to the provisions of chs. SPS 361 to 366, the department shall issue a conditional approval. A conditional approval issued by the department may not constitute an assumption of any liability for the design or construction of the manufactured building.

SPS 361.47(3)(a)2. **2.** 'Written notice.' A conditional approval under subd. 1. shall be **in writing** and sent to the manufacturer and the person submitting the application for approval. Any noncompliance specified in the conditional approval shall be corrected before the manufacture, sale, or installation of the dwelling, building system, or component.

SPS 361.47(3)(a)3. **3.** 'Stamping of plans, specifications, and compliance assurance program.' Plans, specifications, and compliance assurance programs that are conditionally approved under subd. 1. shall be stamped "conditionally approved." **At least 3 copies and** shall be returned to the person designated on the application for approval and one copy shall be retained by the department.

SPS 361.47(3)(b) **(b)** *Denial.*

SPS 361.47(3)(b)1.1. 'Department review.' If the department determines that the plans, specifications, or the application for approval do not substantially conform to the provisions of this subchapter and chs. SPS 361 to 366, the application for approval shall be denied.

SPS 361.47(3)(b)2. **2.** 'Written notice.' A denial under subd. 1. shall be in writing and sent to the manufacturer and the person submitting the application for approval. The notice shall state the reasons for denial.

SPS 361.47(3)(b)3. **3.** 'Stamping of plans, specifications, and compliance assurance program.' Plans, specifications, and compliance assurance programs for which approval is denied under subd. 1. shall be stamped "not approved." **At least 3 copies** and shall be returned to the person submitting the application for approval and one copy shall be retained by the department.

SPS 361.47(4) **(4)** EVIDENCE OF APPROVAL. At each manufacturing plant where a modular multifamily building system or building system component is manufactured, the manufacturer shall keep one set of plans and specifications bearing the stamp of conditional approval. The conditionally approved plans and specifications shall be available for inspection by an authorized representative of the department during normal working hours.

SPS 361.47(5) **(5)** INSPECTIONS. Manufacturers shall contract with an independent inspection agency to conduct in-plant inspections to assure that the manufactured **commercial buildings**, modular multifamily building system and the building system components are in compliance with the plans and specifications approved by the department and that the manufacturer has established a compliance assurance program, as required under s. SPS 361.46 (2). All inspections, for the purpose of administering and enforcing chs. SPS 361 to 366, shall be performed by a Wisconsin certified commercial building inspector

*SPS 361.47 Note* **Note:** Plumbing installation inspection criteria can be found in ch. SPS 382.

SPS 361.47(6) **(6)** WISCONSIN INSIGNIA.

SPS 361.47(6)(a) **(a)** *Insignia process.* Upon departmental approval of the plans and satisfactory in-plant inspections of the modular multifamily building system and the building system components, a Wisconsin insignia shall be purchased from the department in accordance with the fee established in s. SPS 302.34 (6). A manufacturer shall display a Wisconsin insignia on any approved modular **commercial buildings**, multifamily building system or building system component.

SPS 361.47(6)(b) **(b)** *Lost or damaged insignia.*

SPS 361.47(6)(b)1.1. 'Notification.' If a Wisconsin insignia becomes lost or damaged, the manufacturer or dealer shall immediately notify the department in writing.

SPS 361.47(6)(b)2. **2.** 'Return of damaged insignias.' If a Wisconsin insignia becomes damaged, the purchaser shall return the insignia to the department with the appropriate fee to obtain a new insignia.

SPS 361.47(6)(c) **(c)** *Affixing Wisconsin insignias.* Each Wisconsin insignia shall be assigned and affixed to a specific manufactured modular **commercial buildings**, multifamily dwelling unit or building system component that is specified by the department before the dwelling is shipped from the manufacturing plant.

SPS 361.47(6)(d) **(d)** *Insignia records.*

SPS 361.47(6)(d)1.1. 'Manufacturer's insignia records.' The manufacturer shall keep permanent records regarding the handling of all Wisconsin insignias, including construction compliance certificates, indicating the number of Wisconsin insignias that have been affixed to a modular **commercial buildings**, multifamily building, building system component, or groups of building components; which Wisconsin



insignias have been applied to which manufactured modular **commercial buildings**, multifamily dwelling or manufactured building system component; the disposition of any damaged or rejected Wisconsin insignias; and the location and custody of all unused Wisconsin insignias. The manufacturer or the independent inspection agency shall maintain the records for at least 10 years. The manufacturer shall send a copy of the records to the department upon request.

[SPS 361.47\(6\)\(d\)2.](#) **2.** 'Construction compliance certificate.' Within 30 days after receiving the original Wisconsin insignias from the department, and at the end of each month thereafter, the manufacturer shall submit a construction compliance certificate, on a form designated by the department, for each manufactured commercial building or dwelling intended for sale, use, or installation in the state.

**SPS 361.47 Note** **Note:** A construction compliance certificate form is available from the department's Division of Industry Services website at [dps.wi.gov](http://dps.wi.gov).

[SPS 361.47\(6\)\(e\)](#) **(e)** *Unit identification.* Each modular **commercial building**, multifamily dwelling unit and major transportable section or component shall be assigned a serial number.

[SPS 361.47\(6\)\(f\)](#) **(f)** *Right to Install.* Modular **commercial buildings**, multifamily housing, modular multifamily building systems, and building system components that bear the Wisconsin insignia may be manufactured, offered for sale, and installed anywhere in Wisconsin where the installation site complies with the other provisions of chs. [SPS 361](#) to [366](#).

**SPS 361.47 History** **History:** [CR 16-094: cr.](#), [Register April 2018 No. 748](#) eff. 5-1-18.

[SPS 361.48](#) **SPS 361.48** **Suspension and revocation of approval.** The department shall suspend or revoke its approval of a modular **commercial buildings**, multifamily building system or building system component if it determines that the standards for construction or the manufacture and installation of a modular **commercial buildings**, multifamily building system or modular multifamily building system component do not meet the standards established under chs. [SPS 361](#) to [366](#) or that those standards are not being enforced as required by chs. [SPS 361](#) to [366](#). The procedure for suspension and revocation of approval shall be as follows:

[SPS 361.48\(1\)](#) **(1)** **FILING OF COMPLAINT.** Proceedings to suspend or revoke an approval may be initiated by the department or an independent inspection agency or Wisconsin commercial building certified inspector having a contract with the manufacturer whose approval is sought to be suspended or revoked. Initiation shall be by a signed, **written** complaint filed with the department. Any alleged violation of the code shall be set forth in the complaint with particular reference to the time, place, and circumstance of the alleged violation.

Down

Up

[SPS 361.48\(2\)](#) **(2)** **INVESTIGATION AND NOTIFICATION.** The department may investigate alleged violations on its own initiative or upon the filing of a complaint. If the department determines that no further action is warranted, it shall notify the complainant and the respondent, and the municipality, if applicable. If the department determines that there is probable cause, it shall order a hearing and notify the complainant and the respondent, and the municipality, if applicable.

[SPS 361.48\(3\)](#) **(3)** **MAILING.** Unless otherwise provided by law, all orders, notices, and other papers shall be served by the department by certified mail to the persons affected at their last known address. If the service is refused, service may be made by sheriff without amendment of the original order, notice, or other paper.

SPS 361.48(4) **(4)** RESPONSE. Upon receipt of notification of hearing from the department, the person charged with noncompliance or nonenforcement may submit to the department a **written response** within 30 days of the date of service. If the person charged files a timely written response, such person shall thereafter be referred to as the respondent.

SPS 361.48(5) **(5)** CONCILIATION AGREEMENT PRIOR TO HEARING. If the department and the respondent are able to reach agreement on the disposition of a complaint prior to a hearing, such agreement shall be transmitted **in writing** to the secretary. Until the agreement has been accepted by the secretary, it is not considered a waiver of any defense, nor is it considered an admission of any fact, and is not binding upon any party until signed by all parties.

SPS 361.48(6) **(6)** HEARINGS.

SPS 361.48(6)(a) **(a)** *Subpoenas; witness fees.* The department or the clerk of any court of record shall sign and issue subpoenas. The respondent shall pay the witness fees and mileage of the witnesses subpoenaed on behalf of the department at the rate prescribed for witnesses in circuit court.

SPS 361.48(6)(b) **(b)** *Conduct of hearings.* All hearings shall be conducted in accordance with s. 101.02, Stats.

SPS 361.48(7) **(7)** FINDINGS. The department shall make findings and enter its order in accordance with s. 101.02, Stats. The findings and order shall be in writing and shall be binding unless appealed.

SPS 361.48(8) **(8)** APPEAL ARGUMENTS. Appeal arguments shall be submitted to the department in writing in accordance with s. 101.02, Stats., unless otherwise ordered. The department shall review and make a determination on an appeal of notification of suspension or revocation of approval in accordance with s. 101.02, Stats.

SPS 361.48 History **History:** CR 16-094: cr., Register April 2018 No. 748 eff. 5-1-18.

SPS 361.485 **SPS 361.485** **Effect of suspension and revocation.**

SPS 361.485(1) **(1)** BEARING OF INSIGNIA. Upon suspension or revocation by the department of the approval of any manufactured modular **commercial buildings**, multifamily dwelling or manufactured building component, the manufacturer may not attach a Wisconsin insignia to any modular **commercial buildings**, multifamily dwelling or building component manufactured for which the approval was suspended or revoked. Upon the expiration date of the suspension or revocation, the manufacturer may resume the attachment of insignias to the dwelling or building component manufactured after the date approval is reinstated. If any **commercial building**, dwelling or building component was manufactured during the period of suspension or revocation, the manufacturer may not attach the Wisconsin insignia unless the department has inspected, or caused to be inspected, the manufactured modular **commercial buildings**, multifamily dwelling or manufactured building component and is satisfied that all requirements for certification have been met.

SPS 361.485(2) **(2)** RETURN OF INSIGNIAS. The manufacturer shall return to the department all insignias allocated for a manufactured **commercial buildings**, modular multifamily dwelling or manufactured building component no later than 30 days from the effective date of any suspension or revocation of the approval by the department. The manufacturer shall also return to the department all insignias that it determines are no longer needed.

SPS 361.485 History **History:** CR 16-094: cr., Register April 2018 No. 748 eff. 5-1-18.

## Current

**(4) PLUMBING AND MECHANICAL SYSTEMS.** Substitute the following wording for the requirements and the exception in IBC section 3002.9:

(a) *General.* Except as specified in par. (b), plumbing and mechanical systems shall not be located in an elevator shaft.

(b) 1. Except as provided in subd. 2., A drain or sump complying with ss. SPS 382.33 and 382.36 shall be provided in an elevator pit. Connection of the drain or sump to a sanitary system is prohibited.

2. An elevator pit is exempt from the sump or drain requirement under subd. 1. for any of the following situations:

a. The floor of an elevator walk-in pit is level with the adjacent floor.

b. The elevator does not extend to the building's lowest floor level and the pit floor is not in contact with the earth.

c. The pit floor is above adjacent grade where the elevator hoistway shaft has one or more exterior walls.

d. The pit will not allow the entrance of ground water and will not be greater than 16 inches in depth.

3. The aggregate capacity for drainage from the pit shall be at least one of the following:

a. 30 gpm in a hoistway with one elevator.

b. 50 gpm in a hoistway with two or three elevators.

## PROPOSED

### **(4) PLUMBING AND MECHANICAL SYSTEMS.**

Add a note: See s. SPS 832.36(14) (this would include all the language above and 14 would be a new paragraph)

The current 2015 IBC applicable code section:

**3002.9 Plumbing and mechanical systems.** Plumbing and mechanical systems shall not be located in an elevator hoistway enclosure.

**Exception:** Floor drains, sumps and sump pumps shall be permitted at the base of the hoistway enclosure provided they are indirectly connected to the plumbing system.

The current 2021 IBC applicable code section:

**3002.9 Plumbing and mechanical systems.** Plumbing and mechanical systems shall not be located in an elevator hoistway enclosure.

**Exception:** Floor drains, sumps and sump pumps shall be permitted at the base of the hoistway enclosure provided that they are indirectly connected to the plumbing system.



<u>Number</u>	<u>SPS/ICC</u>	<u>ICC</u> <u>Section</u>	<u>SPS</u> <u>Section</u>	<u>Problem</u>	<u>Recommendation</u>	<u>Positive Impact</u>	<u>Cost Impact</u>	<u>Parties Affected</u>	<u>Submitter</u>	<u>Resolu</u> <u>tion</u>
	SPS		362.3002 (4)	Current language is not in the Plumbing Code	Shift language to SPS 832.36(14)	Allows plumbing inspectors to inspect	None	Commercial Building Inspectors/Plumbing inspectors	J Gavin	
	SPS		361.45-.485(2)	Current language only addresses manufactured modular multi-family construction	Add commercial buildings to the language to encompass all manufactured modular construction	Allows language to address modular commercial buildings	None	Inspectors, plan reviewers, contractors	J. Gavin	
	SPS		365.0001		No Change					
	SPS		365.0100		No Change					
	SPS		365.0101		No Change					
	SPS		365.0202		No Change					
	SPS		365.0300		No Change					
	SPS		365.0301		No Change					
	SPS		365.0303		No Change					
	SPS		365.0304		No Change					
	SPS		365.0400		No Change					
	SPS		365.0501		No Change					
	SPS		365.0502		No Change					

121	IFGC	502.1		NFPA 54-18 requires that UL 1738 be applicable for venting systems. At present Schedule 40 solid wall or foam core drain, waste and vent pipe and fittings are allowed if they are referenced as options in the appliance installation instructions. These products were never intended to be used in Fuel-Gas Venting (FGV) applications, but they have been chosen because they are often the least expensive materials available. Several manufacturers of these products have stated time and again that these products are not suitable for FGV. These products do not meet the key performance requirements nor most of the material requirements of UL 1738. Meeting UL 1738 ensures that the venting system is suitable and safe for FGV applications intended to vent categories II and IV gas-burning appliances. --Randy Dahmen, PE has artical for reference	Create an amendment, " <u>Plastic venting systems associated with gas-fired appliances shall meet the requirements of UL 1738, inclusive of specific testing and marking requirements for pipe, fittings and cement.</u> "	Safety, Code consistency/clarity	HVAC Contractors will be required to install a venting material that is more expensive then what they are currently installing.		R. Dahmen	
	SPS		365.0621		No Change					
	SPS		365.0630		No Change					
	SPS		365.0631		No Change					
	SPS		365.0632		No Change					
	SPS		365.0800		No Change					
	SPS		365.0900		No Change					



*Welcome to the*

# 2019 Annual Conference Educational Sessions



**Session: Venting. Reinvented, UL 1738 Fuel Gas Venting Systems**



# UL 1738 Flue Gas Venting Systems

Venting. ReInvented.

Gaetano Altomare  
Product Manager - Plumbing



# IPEX Group

Mechanical / Plumbing



Industrial



Municipal / Irrigation



Electrical / Telecom



# Agenda

1. **What is Flue Gas?**
2. **Venting History**
3. **Model Codes and Standards**
4. **UL 1738**
5. **System 1738**
6. **Design Considerations**
7. **Installation Requirements**

## What is Flue Gas?

- Flue Gas is a by-product of incomplete combustion often coming from sources such as a fireplace, oven, furnace, boiler, water heater or steam generator.



Natural Gas + Oxygen → Carbon Monoxide + Water Vapor + Carbon (Soot)

- It consists mainly of **carbon monoxide** and **water vapor** and is required to be vented safely to avoid injury.

# What is Flue Gas?

Gas-Fired Appliances are divided into 4 venting categories:

1. Category I – Negative Pressure, Non-Condensing
2. Category II – Negative Pressure, Condensing
3. Category III – Positive Pressure, Non-Condensing
4. Category IV – Positive Pressure, Condensing

Today, we will be speaking about venting Category II and IV Appliances

# Agenda

1. What is Flue Gas?
2. **Venting History**
3. Model Codes and Standards
4. UL 1738
5. System 1738
6. Design Considerations
7. Installation Requirements

# Venting History – Conflicting Standards?

- Appliance Manufacturer's currently dictate which materials are approved for venting with their appliance in conjunction with the local codes.
- Since no practical venting standards existed, appliance manufacturer's referenced ASTM plumbing standards in their installation manuals.

- **Example:**

**APPROVED MATERIALS**

Approved vent and intake air pipe materials that may be used in the United States:

**PVC pipe materials:**

- DWV ASTM-D2665 or CSA B181.2
- Schedule 40, 80, 120 ASTM-D1785 or CSA B137.3
- SDR Series ASTM-2241 or CSA B137.3

**CPVC pipe materials:**

- CPVC 41 ASTM-D2846 or CSA B137.6
- Schedule 40, 80 ASTM-F441 or CSA B137.6
- SDR Series ASTM-F442

## Venting History – Conflicting Standards?

- Conversely, manufacturer's of the plumbing pipe and fittings do not endorse, promote or warranty their products for flue gas venting applications.
- **The Reason:**
  - Products manufactured to ASTM Standards are manufactured for fluid handling applications and are not designed or tested for flue gas venting applications



# Industry Concerns



# CO Statistics

- In 2014, the Consumer Product Protection Association reported 165 unintentional non-fire CO poisoning deaths; an increase of 11% from the average number of reported incidents between 2012–2013.
- Of these reported incidents, heating system fatalities represented the largest percentage at 39% or 65 deaths.
- Some examples of vent failures that exhibit either embrittlement, material degradation or vent separation were reported and documented in Aspen Colorado, Nashua New Hampshire, South Bend Indiana, and Port Mouth Virginia



# Agenda

1. What is Flue Gas?
2. Venting History
3. **Model Codes and Standards**
4. UL 1738
5. System 1738
6. Design Considerations
7. Installation Requirements

## Model Codes and Standards

– The following ASTM Plumbing Standards are commonly referenced in appliance manufacture's installation manuals:

- ASTM D2665 – PVC Plastic Drain, Waste and Vent Pipe and Fittings
- ASTM D1785 – PVC Plastic Pipe, Schedules 40, 80 and 120
- ASTM D2241 – PVC Pressure-Rated SDR Pipe
- ASTM D2846 – CPVC Plastic Hot and Cold Water Distribution Systems
- ASTM F441 – CPVC Plastic Pipe Schedule 40 and 80
- ASTM F442 – CPVC Plastic Pipe SDR
- ASTM D2661 – ABS Schedule 40 Plastic Drain, Waste and Vent Pipe and Fittings

These standards are all intended for fluid handling applications

## Model Codes and Standards

- As a result of plumbing products being used for flue gas venting applications and appliance manufacturer's referencing these standards, the following note has been added to the ASTM D1785 standard scope:
- **NOTE:** This standard specifies dimensional, performance and test requirements for plumbing and fluid handling applications only. It does not include provisions for the use of these products for venting of combustion gases. **UL 1738 is a standard that does include specific testing and marking requirements for flue gas venting products, including PVC.**
- This note or something similar has been added to each of the ASTM plumbing standards previously shown.

# Model Code and Standards - Update

## 2018 National Fire Protection Association (NFPA) Code 54 – National Fuel Gas Code

### – NFPA 54 – Chapter 12, Section 5: Venting Appliances, Type of Venting Systems to Be Used, states:

#### 12.5.2 Plastic Piping.

Where plastic piping is used to vent an appliance, the appliance shall be listed for use with such venting materials and the appliance manufacturer's installation instructions shall identify the specific plastic piping material. The plastic pipe venting materials shall be labeled in accordance with the product standards specified by the appliance manufacturer **or shall be listed and labeled in accordance with ANSI/UL 1738: *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV.***

#### 12.5.3 Plastic Vent Joints.

Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions. **Plastic pipe venting materials listed and labeled in accordance with ANSI/UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV,* shall be installed in accordance with the vent manufacturer's installation instructions.** Where primer is required it shall be of contrasting color.

# Model Code and Standards - Update

## 2018 International Fuel Gas Code (IFGC)

### – IFGC Chapter 5, Section 3: - Chimneys and Vents, Venting of Appliances:

#### 503.4.1 Plastic Piping.

Where plastic piping is used to vent an appliance, the appliance shall be listed for use with such venting materials and the appliance manufacturer's installation instructions shall identify the specific plastic piping material. The plastic pipe venting materials shall be labeled in accordance with the product standards specified by the appliance manufacturer **or shall be listed and labeled in accordance with ANSI/UL 1738.**

#### 503.4.1.1 Plastic Vent Joints.

Plastic pipe and fittings used to vent appliances shall be installed in accordance with the *appliance* manufacturer's instructions. **Plastic pipe venting materials listed and labeled in accordance with UL 1738 shall be installed in accordance with the vent manufacturer's installation instructions.** Where primer is required it shall be of contrasting color.

# Model Code and Standards - Update

## What Does this Mean?

- I. Appliance manufacture's will still dictate suitable materials for venting their appliances
- II. Installers now have a choice:
  1. Use products listed to ASTM plumbing standards
  2. Use products certified to UL 1738

The ASTM plumbing standards state they are not suitable for venting poisonous flue gasses.

Therefore, utilizing materials listed to UL 1738 is something designers, manufacturer's and installers should be **considering** and **recommending** until it becomes enforced.

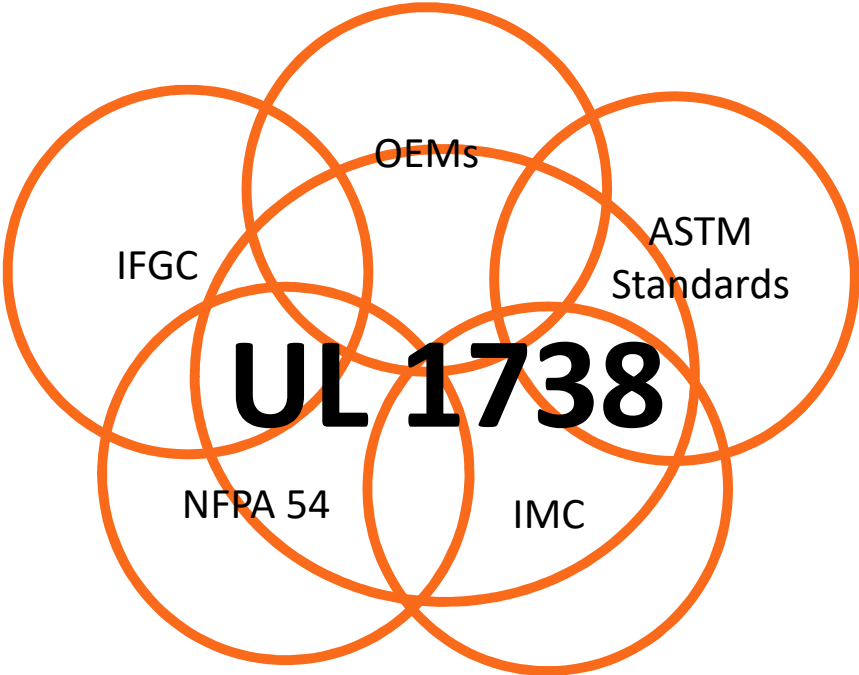


# Appliance Standards – ANSI Z21

Maximum allowable temperatures of typical non-metallic vent material used in water heaters

Material	Heat deflection temperature*, ° F (° C)	Pipe nomenclature	Standard
PVC	158 (70)	DWV	ASTM-D2665 or CSA B181.2
PVC	158 (70)	Sch 40, 80, 120	ASTM-D1785 or CSA B137.3
PVC	158 (70)	SDR Series	ASTM-D2241 or CSA B137.3
CPVC	212 (100)	CPVC 41	ASTM-D2846 or CSA B137.6
CPVC	212 (100)	Sch 40, 80	ASTM-F441 or CSA B137.3
CPVC	212 (100)	SDR Series	ASTM-F442
ABS	180 (82)	Sch 40 DWV	ASTM-D2661 or CSA B181.1

# Paradox of Rules?

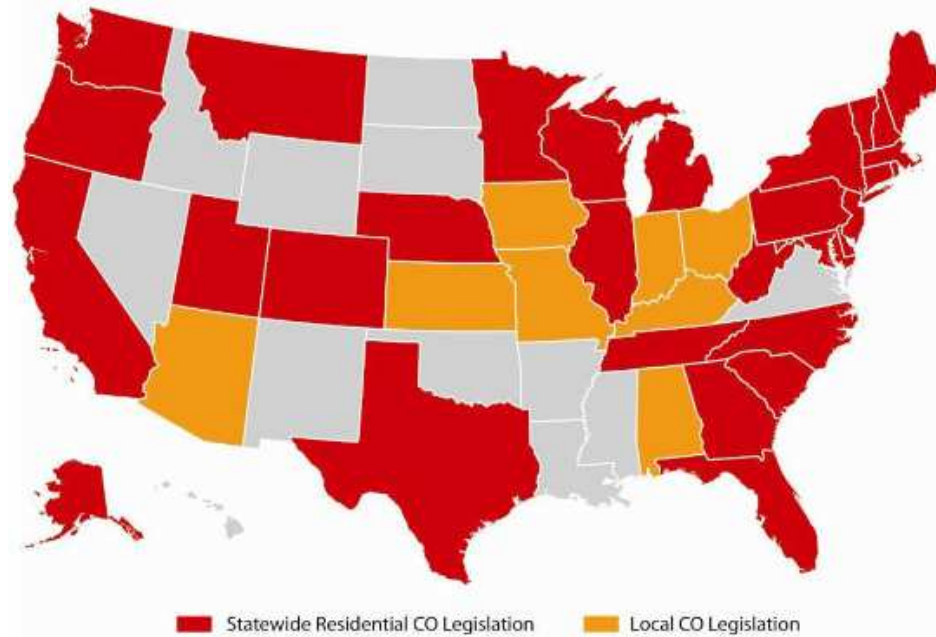


## Model Codes and Standards

- There is a clear disconnect between appliance manufacturer's, vent manufacturer's and model codes and standards.
- **The Solution is simple – UL 1738.**
- UL 1738 allows for:
  - The appliance manufacturer's to continue dictating their preferred venting material.
  - Certified venting materials to replace plumbing products which are not intended for the application or warranted by their manufacturer's.
  - A uniform standard that eliminates the disorganization and confusion that comes with each jurisdiction using their adopted codes and standards

# Make it Law

**Carbon Monoxide Alarms are required in 30 states.  
These states are highlighted in red.**



# Agenda

1. What is Flue Gas?
2. Venting History
3. Model Codes and Standards
4. **UL 1738**
5. System 1738
6. Design Considerations
7. Installation Requirements

## UL 1738

- UL 1738 is a standard for Venting Systems for Gas-Burning Appliances, Categories II, III, and IV.
- It covers both metallic and non-metallic materials and includes over 50 material and system performance tests.
- Using products listed to UL 1738 provides the **highest possible chance of success** for flue gas venting applications.



# UL 1738 Key Test Requirements

Section	System Performance Test Requirements	UL 1738	Section	Material Conditioning & Test Requirements	UL 1738
19	Temperature Structure	✓	40.2	Elevated temperature conditioning	✓
22.4	Joint Load	✓	40.3	Light and Water conditioning	✓
28	Vent Sag	✓	40.4	Condensate conditioning	✓
29	Puncture	✓	42.2	Tensile	✓
35	Joint Tightness	✓	42.3	Impact	✓
37	Low Temperature Handling	✓	42.5	Flammability	✓
42.4	Crush Resistance and Stiffness	✓	43.1	Heat deflection Temperature	✓

## UL 1738 – Additional Requirements

- Products certified to UL 1738 require listed print lines on pipe and labels on fittings that allow for identification regardless of orientation.
- Manufacturer's of UL 1738 products are required to provide installation instructions for their products.
- UL 1738 states **NO mixing of components** from different manufacturer's in a single vent system.
- Using UL 1738 certified products provides the **greatest possible chance of success** in flue gas venting applications



## Codes and Standards – Precedent

- Adopting a venting standard is not without precedent...
- In 2007, CSA B149.1 was mandated in Canada and required that all vent material/systems be certified to ULC S636. This included PVC, CPVC, PP and SS.
- This covered all new and retrofit installations and required all installations use one brand for pipe, fittings, cements and transitions.
- Appliance manufacturer's still dictate which vent material is approved to vent their appliance.

# Agenda

1. What is Flue Gas?
2. Venting History
3. Model Codes and Standards
4. UL 1738
5. **System 1738**
6. Design Considerations
7. Installation Requirements



# System 1738 – Pipe

Pipe is Black with 2 Orange print lines 180° apart

- **Line A:** System 1738 ® Gas Vent Categories II, IV 149°F / 65°C PVC Ⓢ UL 1738 Min. Clearance to combustible construction 0mm – manufacture's installation instruction must be followed / [<Date Code>](#) Made in USA by IPEX USA LLC
- **Line B:** Ⓢ System 1738 ® Gas Vent Categories II, IV 149°F / 65°C Ⓢ System 1738 Gas Vent Categories II, IV 149°F / 65°C



**! WARNING / ADVERTANCIA**

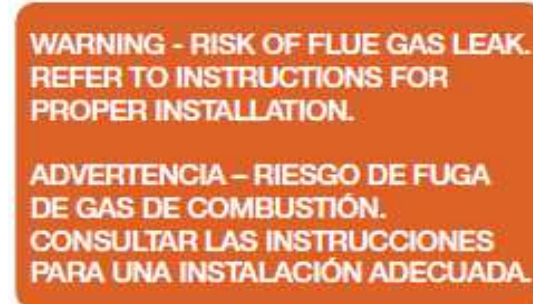
RISK OF CARBON MONOXIDE (CO) POISONING AND RISK OF FIRE IF IMPROPERLY INSTALLED. FOLLOW ALL CAUTIONS, WARNINGS, AND INSTRUCTIONS REGARDING INSTALLATION OF THE VENT PIPE SYSTEM.

RIESGO DE INTOXICACIÓN POR MONÓXIDO DE CARBONO (CO) Y RIESGO DE INCENDIO SI SE INSTALA INCORRECTAMENTE. SIGA TODAS LAS PRECAUCIONES, ADVERTENCIAS E INSTRUCCIONES RELACIONADAS CON LA INSTALACIÓN DEL SISTEMA DE TUBERÍA DE VENTILACIÓN.

## System 1738 – Fittings

Fittings are Black with 2 Orange labels 180° apart on the fitting hub

- **Label A:** System 1738 ®
- **Label B:** Carbon Monoxide Warning (only used with tee-wye fitting)



# System 1738 – Primer & Cement

## IPEX System 1738 Labelled Primer & Cement

- Primer is fluorescent yellow to provide contrasting color per UL 1738
- Cement is auburn to match the pipe print line color
- Low VOC
- Optical Brightener for Compliance Verification
- Pint and Quart Sizes



# System 1738 – Concentric Terminations



- Sizes include 2", 3" and 4"
- Single termination hole
- Various lengths up to 44"
- Solvent Weld or Mechanically Fastened Cap
- Can be painted to match building exterior
- Bird Screen, Face Plate & Roof Flashing Accessories available
- Must be approved by the appliance manufacturer

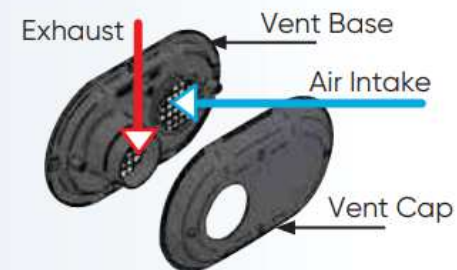
## System 1738 – Low Profile Terminations

- Sizes include 2", 3" and 4"
- Two hole termination
- Can be painted to match building exterior
- Must be approved by the appliance manufacturer



### Low Profile Side Wall Vent Kit

Offers a lower profile alternative to the typical two pipe side wall snorkel termination. They include integrally molded vent screens, and the design neatly disguises both the intake and exhaust.





# System 1738 – Specialty Fittings

## Access Tee

- Drilling of System 1738 is prohibited
- Drilling compromises system integrity and can result in stress cracking
- Caulking or metal tape are not permanent solutions
- The System 1738 Access Tee provides a safe method for testing appliance combustion gasses.



## System 1738 - Accessories

- Pipe Cutter
- Deburring Tool

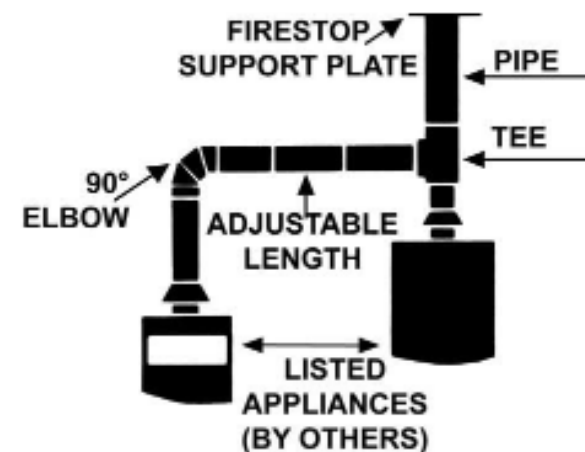


# System 1738 – Design & Installation

## Vent Sizing

- What material should be used to vent?
- What should the vent size be?
- What is the maximum vent length allowed with the appliance?
- What is the equivalent vent length of each fitting?

✓ Consult the appliance manufacturer's installation instructions



# System 1738 – Design & Installation

IPEX offers a comprehensive Installation Guide that outlines best practices covering:

- Terminations – Side Wall, Pitched and Flat Roof
- Chimney Installations
- Support and Restraint Spacing
- Expansion and Contraction
- Firestops
- Appliance Vent Connections

**While you must always follow local codes, IPEX offers support when you need it.**

## System 1738 – Training

In addition to the comprehensive Installation Guide, IPEX offers training to **engineers, inspectors, distributors** and **contractors**.

- Training can be done:
  - Online
  - Through distributors
  - On site



- Following successful training, a training card will be issued to successful participants.

# System 1738 – Product Warranty

System 1738 offers a **10 year** product warranty

- Products must be installed in accordance with the System 1738 Installation Guide

**IPEX is the only PVC manufacturer to offer a warranty for flue gas venting applications**



## System 1738 – Additional Listings

System 1738 products carry the UMC Shield and are certified by IAPMO to be in compliance with UL 1738 and the following codes:

- Uniform Mechanical Code (UMC®)
- International Mechanical Code (IMC®)
- International Fuel Gas Code (IFGC®)
- National Fuel Gas Code (NFPA 54)

# UL 1738 Benefits

<b>UL 1738</b>	
A.H.J	<ul style="list-style-type: none"> <li>• Risk and liability mitigation</li> <li>• Education and awareness</li> <li>• Unique identification markers with pipe, fittings and cements</li> </ul>
OEM	<ul style="list-style-type: none"> <li>• Risk and liability is shifted to vent manufacturer</li> <li>• Certified vent solution</li> <li>• A one source trusted vent partner with a drive to innovate</li> </ul>
Contractor	<ul style="list-style-type: none"> <li>• Installation resources and training</li> <li>• Product certified for the application</li> <li>• Solvent weld joining system</li> </ul>



## Summary

- In Flue Gas Venting applications, where failure can result in injury, using products that provide the best chance for success is the clear choice and right thing to do.
- NFPA 54 and IFGC Model Codes now recognize UL 1738 as the appropriate flue gas venting standard and have included it in their 2018 model codes.
- ASTM Plumbing Standards now include a note stating they are intended for fluid handling applications only and refer to UL 1738 as the appropriate flue gas venting standard.
- UL 1738 certified products still provide appliance manufacturers the freedom to dictate venting materials, while giving installers and end-users the confidence of a certified system that has been tested for the application

## Summary

- System 1738 is the first Engineered PVC System that is certified to UL 1738 for Flue Gas Venting Applications
- IPEX offers a comprehensive installation guide and training to inspectors, engineers, distributors and contractors to provide users with the highest chance of success.
- System 1738 products come with a 10 year product warranty making System 1738 the only PVC system that is warrantied in flue gas venting applications.

# Is Good Enough, Enough?



# Is Good Enough, Enough?





**Thank You For  
Attending**





**IPEX**

by **alixis**

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