

# 2020 Advanced Florida Building Code – Mechanical - Significant Code Changes



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# 2020 Advanced Florida Building Code – Mechanical - Significant Code Changes

By

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1 PDH HOUR

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# 2020 Advanced Building Code - Mechanical Significant Code Changes – Internet Course #1045.0

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## Objective

The objective of this course is to review the significant code changes in the 7th Edition (2020) update to the Florida Building Code: Mechanical as compared to the 6th Edition 2017 Florida Building Code: Mechanical. All sections of the Florida Building Code can be viewed at <https://floridabuilding.org>.

This is an advanced code course intended to fulfill the 1-hour Advanced Florida Building Code course requirement for engineers who practice engineering that is related to building design or systems. This course covers the most significant changes in the 2020 Florida Building Code Mechanical and is designed for mechanical engineers. The deadline to complete this course in Florida is December 31st, 2021.



## Introduction

The 7<sup>th</sup> Edition of the Florida Building Code became effective on December 31, 2020. This code is based on the latest changes to the 2018 International Mechanical Code® with customized amendments adopted statewide. This course only reviews the significant changes made to the mechanical code. Reference the original text to ensure that the appropriate context is used during design.

The mechanical code references other texts as well. Review the referenced materials that have changed version during this update.

## Changes to Chapter 2 – Definitions

### Approved Agency

There has been a slight rewording of the definition of “approved agency” to include agencies that furnish product certification.

### Balanced Ventilation

The definition of balanced ventilation has been added to the code. It quantifies the allowed differential between the supply and exhaust. The maximum differential is “10% of the total mechanical supply airflow rate.”

The new definition is as follows:

“BALANCED VENTILATION. Any combination of concurrently operating mechanical exhaust and mechanical supply whereby the total mechanical exhaust flow rate is within 10% of the total mechanical supply airflow rate.”

### Labeled

Similar to the change in the definition of “approved agency,” the definition of “labeled” was also modified. The words “inspection agency” were changed to “approved agency.” This minor change provides the code official with more authority.

### Large Diameter Ceiling Fan

A definition of a large-diameter ceiling fan has been added to the definitions chapter. The 7th edition defines it as a ceiling fan that has a diameter more than seven feet.

### Piping

Copperalloy was added to the pipe and tubing definition and brass was added to the tubing definition.

### Pollution Control Unit

A definition for pollution control unit was added to the 7th edition. It reads, “POLLUTION CONTROL UNIT (PCU). Manufactured equipment that is installed in a grease exhaust duct system for the purpose of extracting smoke, grease particles and odors from the exhaust flow by means of a series of filters.”

### Press-Connect Joint

In 2017 Florida Building Code – Mechanical, 6th edition, there was a definition for the term “press joint.” In the 2020 Florida Building Code, Mechanical, 7th edition, the term was changed to “press-connect joint.” The definition remained the same; see below.

“**PRESS-CONNECT JOINT.** A permanent mechanical joint incorporating an elastomeric seal or an elastomeric seal and corrosion-resistant grip ring. The joint is made with a pressing tool and jaw or ring approved by the fitting manufacturer.”

### Changes to Chapter 3 – General Regulations

*Table 305.4 Piping Support Spacing*

In the 6th edition, the maximum horizontal and vertical spacing of piping support was different for copper or copper-alloy tubing that was 1 ¼“ diameter and smaller versus tubing that was 1 ½“ and larger. The vertical spacing requirement stays the same at 10 feet, but the horizontal spacing for the larger pipe became more stringent and the spacing for the smaller pipe became less stringent.

Below are the old requirements:

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Copper or copper-alloy tubing, 1¼-inch diameter and smaller	6	10
Copper or copper-alloy tubing, 1½-inch diameter and larger	10	10

Below are the new revised requirements:

PIPING MATERIAL	MAXIMUM HORIZONTAL SPACING (feet)	MAXIMUM VERTICAL SPACING (feet)
Copper or copper-alloy tubing	8	10

#### 307.2.2 Drain pipe materials and sizes

“Brass“ and “copper alloy“ have been added to the list of possible condensate disposal system materials.

## Changes to Chapter 4 – Ventilation

*TABLE 403.3.1.1 Minimum Ventilation Rates*

The minimum ventilation rates for some of the occupancies listed in Table 403.1.1 were updated. New or more stringent requirements were added.

See excerpt of Table 403.3.1.1 below.

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT <sup>2</sup>	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R <sub>p</sub> CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R <sub>a</sub> CFM/FT <sup>2</sup>	EXHAUST AIRFLOW RATE CFM/FT <sup>2</sup>
<b>Dry cleaners, laundries</b>				
Coin-operated laundries	20	7.5	0.12	-
<b>Food and beverage service</b>				
Kitchens (cooking)	20	7.5	0.12	0.7
<b>Retail stores, sales floors and showroom floors</b>				
Shipping and receiving	2	10	0.12	-
Warehouses (see storage)	-	10	0.06	-
<b>Sports and amusement</b>				
Gym, stadium, arena (play area)	7	20	0.18	-
<b>Storage</b>				
Refrigerated warehouses/freezers	-	10	-	-
Warehouses	-	10	0.06	-

### *403.3.2.1 Outdoor air for dwelling units.*

Additional exceptions were added to the requirement for outdoor air in dwelling units in 403.3.2.1. This section deals with Group R-2, R-3 and R-4 occupancies, three stories and less. The second exception included in the excerpt below has been added to allow for reduced minimum mechanical ventilation rate.

“403.3.2.1 Outdoor air for dwelling units.

An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each dwelling unit. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the building is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.

$$Q_{QA} = 0.01A_{\text{floor}} + 7.5(N_{\text{br}} + 1) \quad (\text{Equation 4-9})$$

where:

$Q_{QA}$  = outdoor airflow rate, cfm

$A_{\text{floor}}$  = floor area, ft<sup>2</sup>

$N_{\text{br}}$  = number of bedrooms; not to be less than one

#### Exceptions:

1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9.
2. The minimum mechanical ventilation rate determined in accordance with Equation 4-9 shall be reduced by 30 percent, provided that both of the following conditions apply:
  - 2.1. A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:
    - 2.1.1. Living room.
    - 2.1.2. Dining room.
    - 2.1.3. Kitchen.
  - 2.2. The whole-house ventilation system is a balanced ventilation system.”

#### 403.3.2.4 Ventilating equipment

A section on ventilating equipment was added, requiring that “exhaust equipment serving single dwelling units shall be listed and labeled to provide the minimum required airflow in accordance with ANSI/AMCA 210-ANSI/ASHRAE 51.”

#### 404.1 Enclosed parking garages

Section 404.1 was rewritten to include installation instructions including stipulating the height of carbon monoxide detectors to be mounted 3 to 5 feet above the floor level and “nitrogen dioxide detectors shall be installed 1 foot below ceiling level.” In addition, the 7th edition stipulates requirements for full-on and standby airflow rates. See excerpt below.

“404.1 Enclosed parking garages.

Mechanical ventilation systems for enclosed parking garages shall operate continuously or shall be automatically operated by means of carbon monoxide detectors applied in conjunction with nitrogen dioxide detectors. Carbon monoxide detectors shall be installed 3 to 5 feet above floor

level and nitrogen dioxide detectors shall be installed 1 foot below ceiling level. Such detectors shall be listed in accordance with UL 2075 and installed in accordance with their listing and the manufacturers' instructions. Automatic operation shall cycle the ventilation system between the following two modes of operation:

1. Full-on at an airflow rate of not less than 0.75 cfm per square foot of the floor area served.
2. Standby at an airflow rate of not less than 0.05 cfm per square foot of the floor area served.”

## **Changes to Chapter 5 – Exhaust Systems**

### 502.16 Repair garages for vehicles fueled by lighter than air fuels

Section 502.16 has been completely rewritten. The title of the section used to be “Repair garages for natural gas- and hydrogen-fueled vehicles.” The in addition to the exception for allowing natural ventilation upon approval by the code official, additional exceptions for not requiring mechanical ventilation are provided for repair garages that do not work on the fuel system.

#### “Exceptions:

1. Repair garages where work is not performed on the fuel system and is limited to exchange of parts and maintenance not requiring open flame or welding on the CNG-, LNG-, hydrogen- or other lighter-than-air-fueled motor vehicle.
2. Repair garages for hydrogen-fueled vehicles where work is not performed on the hydrogen storage tank and is limited to the exchange of parts and maintenance not requiring open flame or welding on the hydrogen-fueled vehicle. During the work, the entire hydrogen-fuel system shall contain a quantity that is less than 200 cubic feet (5.6 m<sup>3</sup>) of hydrogen.”

The exception in section *502.16.2.1 Design*, that allows intermittent ventilation activating by gas detection system has added a quantifiable concentration limit of “25% of the lower flammable limit (LFL)” and the fuel system must shut down in the “event of failure of the exhaust ventilation system.” A minimum exhaust ventilation rate of 1 cfm (cubic foot per minute) per 12 cubic feet of room volume has also been added.

### 504.4.1 Exhaust termination outlet and passageway size

In the clothes dryer exhaust section, an additional requirement was added. Section 504.4.1 stipulates that the exhaust duct must not be smaller than the discharge of the dryer and must be at least 12.5 square inches. This is approximately equivalent to a 4“-round duct. The next change below is somewhat related.

### 504.8.2 Duct installation

The last line of 504.8.2, “Where dryer exhaust ducts are enclosed in wall or ceiling cavities, such cavities shall allow the installation of the duct without deformation,” has been added to the code. Assuming that at least a 4“ round duct, from discussion above, is required for clothes dryer exhaust, the wall cavity must be at least 4“ clear, which is much larger than a standard wall thickness.

### 504.10 Common exhaust systems for clothes dryers located in multistory structures and 505.3 Common exhaust systems for domestic kitchens located in multistory structures

In this section, item #7 clarifies that the exhaust fan used in a common multistory duct system that is used to convey exhaust from multiple clothes dryers or domestic kitchens located in multistory structures “shall be connected to a standby power source **in accordance with Section 2702 of the Florida Building Code, Building.**“ Section 2702 of the Florida Building Code, Building refers to requirements for emergency and standby power systems.

### 506.3.13.2 Termination through an exterior wall

In the section regarding exhaust outlets serving Type I hoods, there is a minor rewording to 506.3.13.2. The wording was changed from, “Other exterior openings shall not be located within 3 feet (914 mm) of such terminations,“ to “Such terminations shall be located in accordance with Section 506.3.13.3 and shall not be located within 3 feet of any opening in the exterior wall.“

Section 506.3.13.3 was already part of the requirements of 506.3.13, so this just appears to be a minor change in wording. See below for exact wording in the 2020 version.

### **“506.3.13.2 Termination through an exterior wall.**

Exhaust outlets shall be permitted to terminate through exterior walls where the smoke, grease, gases, vapors and odors in the discharge from such terminations do not create a public nuisance or a fire hazard. Such terminations shall not be located where protected openings are required by the **Florida Building Code, Building. Such terminations shall be located in accordance with Section 506.3.13.3 and shall not be located within 3 feet of any opening in the exterior wall.**“

### 506.5.2 Pollution control units

Section 506.5.2 “Pollution control units“ has been inserted into the section. It provides installation instructions for equipment installed in a “grease exhaust duct system for the purpose of extracting smoke, grease particles and odors from the exhaust flow by means of a series of filters.“ Some of the key provisions include providing an 18-inch clearance from combustible equipment and installing roof-mounted PCU’s at least 18 inches above the roof. In addition, an airflow differential pressure sensor shall activate a visual alarm in sight of cooking staff. See added section below.



“506.5.2 Pollution control units.

The installation of pollution control units shall be in accordance with the manufacturer's installation instructions and all of the following:

1. Pollution control units shall be listed and labeled in accordance with UL 1978.
2. Fans serving pollution control units shall be listed and labeled in accordance with UL 762.
3. Pollution control units shall be mounted and secured in accordance with the manufacturer's installation instructions and the Florida Building Code, Building.
4. Pollution control units located indoors shall be listed and labeled for such use. Where enclosed duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be located in a room or space having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning the unit. The space or enclosure shall be ventilated in accordance with the manufacturer's installation instructions.
5. A clearance of not less than 18 inches (457 mm) shall be maintained between the pollution control unit and combustible material.
6. Roof-mounted pollution control units shall be listed for exterior installation and shall be mounted not less than 18 inches (457 mm) above the roof.
7. Exhaust outlets for pollution control units shall be in accordance with Section 506.3.13.
8. An airflow differential pressure control shall be provided to monitor the pressure drop across the filter sections of a pollution control unit. When the airflow is reduced below the design velocity, the airflow differential pressure control shall activate a visual alarm located in the area where cooking operations occur.
9. Pollution control units shall be provided with a factory-installed fire suppression system.
10. Service space shall be provided in accordance with the manufacturer's instructions for the pollution control unit and the requirements of Section 306.
11. Wash down drains shall discharge through a grease interceptor and shall be sized for the flow. Drains shall be sealed with a trap or other approved means to prevent air bypass. Where a trap is used it shall have a seal depth that accounts for the system pressurization and evaporation between cleanings.
12. Protection from freezing shall be provided for the water supply and fire suppression systems where such systems are subject to freezing.
13. Duct connections to pollution control units shall be in accordance with Section 506.3.2.3.

Where water splash or carryover can occur in the transition duct as a result of a washing operation, the transition duct shall slope downward toward the cabinet drain pan for a length not less than 18 inches (457 mm). Ducts shall transition to the full size of the units' inlet and outlet openings.

14. Extra-heavy-duty cooking appliance exhaust systems shall not be connected to pollution control units except where such units are specifically designed and listed for use with solid fuels.
15. Pollution control units shall be maintained in accordance with the manufacturer's instructions.“

#### 507.2.6 Clearances for Type I hood

A second exception to an 18-inch minimum clearance to combustibles from a Type 1 hood has been added that allows “Type 1 hoods listed and labeled for clearances less than 18 inches in accordance with UL710” be installed per those listings.

#### 510.8.1 Duct cleanout

In the hazardous duct section, Section 510, a new section 510.8.1 Duct cleanout has been added. It requires “ducts conveying combustible dust as part of a dust collection system shall be equipped with cleanouts that are provided with approved access, predesigned to be disassembled for cleaning or engineered for automatic cleanouts.“ The cleanouts are required “at the base of each vertical duct riser and at intervals not exceeding 20 feet in horizontal sections of duct.“

Below is the exact wording for new requirements:

#### **“510.8.1 Duct cleanout.**

**Ducts conveying combustible dust as part of a dust collection system shall be equipped with cleanouts that are provided with approved access, predesigned to be disassembled for cleaning or engineered for automatic cleanouts. Where provided, cleanouts shall be located at the base of each vertical duct riser and at intervals not exceeding 20 feet in horizontal sections of duct.“**

#### 512.2 Materials

In Section 512 subslab soil exhaust systems, Section 512.2 was modified to allow copper-alloy as an acceptable material for the subslab soil exhaust piping.

## Changes to Chapter 6 – Duct Systems

### 601.5 Return air openings

An exception to the rule prohibiting return air from a closet has been added to the 7th edition. There is a limit to 30 cfm of return air for a closet less than 30 square feet in area, but a 1.5“ undercut, louvered door or transfer grille is required if no supply air is provided to the closet.

See excerpt of all exceptions, including the added one in red, below.

“Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen and are located not less than 10 feet (3048 mm) from the cooking appliances.
2. Dedicated forced air systems serving only the garage shall not be prohibited from obtaining return air from the garage.
3. Taking return air from a closet is not prohibited where such return air taken from closets shall serve only the closet and may be taken from closets that have no dedicated supply duct. Where return air is taken from a closet smaller than 30 square feet (2.8 m<sup>2</sup>), the return air shall be no more than 30 cfm (15 l/s), shall serve only the closet and shall not require a dedicated supply duct. Where return air is taken from a closet smaller than 30 square feet (2.8 m<sup>2</sup>), the closet door shall be undercut a minimum of 1.5 inches (38 mm) or the closet shall include a louvered door or transfer grille with a minimum net free area of 30 square inches (194 cm<sup>2</sup>).“

### 602.2.1.1 Wiring, 602.2.1.2 Fire sprinkler piping, and 602.2.1.3 Pneumatic tubing

These three sections have a similar change to the code language. Combustible electrical wires, cables, optical fiber cables, plastic fire sprinkler piping, and combustible pneumatic tubing exposed within a plenum can no longer just be listed as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet. They must be listed and labeled!

### 602.2.1.6 Foam plastic in plenums as interior finish or interior trim

The requirement for foam plastic in plenums used as interior wall or ceiling finish or interior trim was reworded, but the intent is essentially the same as the 6th edition. The maximum flame spread index is 25 and the maximum smoke-developed index is 50 for foam plastic in contact with airflow in the plenum. A flame spread of 75 and a smoke-developed index of 450 may be used in three circumstances; the plastic foam is separated from the airflow in the plenum by a thermal barrier complying with Section 2603.4 of the Florida Building Code, Building, corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm), or

not less than a 1 inch (25 mm) thickness of masonry or concrete.

Section 2603.4 of the Florida Building Code, Building, reads as follows:

**“2603.4 Thermal barrier.**

Except as provided for in Sections 2603.4.1 and 2603.9, foam plastic shall be separated from the interior of a building by an approved thermal barrier of **1/2-inch (12.7 mm) gypsum wallboard, heavy timber in accordance with Section 602.4 or a material that is tested in accordance** with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275. Combustible concealed spaces shall comply with Section 718.“

The revised Section 602.2.1.6 reads as follows:

**“602.2.1.6 Foam plastic in plenums as interior finish or interior trim.**

**Foam plastic in plenums used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 25 or less and a smoke-developed index of 50 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, and shall be tested in accordance with NFPA 286 and meet the acceptance criteria of Section 803.1.2 of the Florida Building Code, Building.**

**Exceptions:**

- 1. Foam plastic in plenums used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 75 or less and a smokedeveloped index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the plenum by a thermal barrier complying with Section 2603.4 of the Florida Building Code, Building.**
- 2. Foam plastic in plenums used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 75 or less and a smokedeveloped index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the plenum by corrosion-resistant steel having a base metal thickness of not less than 0.0160 inch (0.4 mm).**
- 3. Foam plastic in plenums used as interior wall or ceiling finish or interior trim shall exhibit a flame spread index of 75 or less and a smokedeveloped index of 450 or less when tested in accordance with ASTM E84 or UL 723 at the maximum thickness and density intended for use, where it is separated from the airflow in the plenum by not less than a 1 inch (25 mm) thickness of masonry or concrete.“**

***602.2.1.7 Plastic plumbing piping and tubing***

Similar to wiring, fire sprinkler piping and pneumatic tubing, above, “plastic piping and tubing used in plumbing systems shall be listed and labeled as having a flame spread index of not greater than 25 and a smoke-developed index of not more than 50 when tested in accordance

with ASTM E84 or UL 723.“ Listing alone is no longer enough. But an exception has been added to the code in the 7th edition. See excerpt below.

**“ 602.2.1.7 Plastic plumbing piping and tubing.**

**Plastic piping and tubing used in plumbing systems shall be listed and labeled as having a flame spread index of not greater than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.**

**Exception: Plastic water distribution piping and tubing listed and labeled in accordance with UL 2846 as having a peak optical density not greater than 0.50, an average optical density not greater than 0.15 and a flame spread distance not greater than 5 feet (1524 mm), and installed in accordance with its listing.“**

602.2.1.8 Pipe and duct insulation within plenums

Section 602.2.18 has been added to the current code. It requires pipe and duct insulation within plenums to have a “flame spread index of not more than 25 and a smoke-developed index of not more than 50.“ It is important that the insulation “not flame, glow, smolder or smoke.“

603.5.2 Phenolic ducts

A section on phenolic ducts was added to Chapter 6. It simply requires that they “be constructed in accordance with the SMACNA Phenolic Duct Construction Standards.“

603.8.2 Sealing

In the section on underground ducts, the 7th edition requires that underground ducts be leak tested.

See excerpt from the 7th edition below:

**“603.8.2 Sealing.**

**Ducts shall be sealed, secured and tested prior to concrete encasement or direct burial. Ducts shall be leak tested as required by Section C403 of the Florida Building Code, Energy Conservation.“**

604.11 Vapor retarders

In the section on insulation, an exception was added to the requirement for externally lined ducts used for cooling to have a “vapor retarder having a maximum permeance of 0.05 perm [2.87 ng/(Pa • s • m<sup>2</sup>)] or aluminum foil having a minimum thickness of 2 mils (0.051 mm).“ The exception allows for spray polyurethane foam insulation to only have a “water vapor permeance of not greater than of 3 perm per inch [1722 ng/(s • m<sup>2</sup> • Pa)] at the installed thickness.“

### 607.4 Access and identification

Additional requirements have been added to Section 607.4 that refers to access and identification for fire and smoke dampers. The access doors must be “not less than 12 inches (305 mm) square or provided with a removable duct section,” and they must be “tight fitting and suitable for the required duct construction.” Guidance has also been added for dampers with restricted access. “Where space constraints or physical barriers restrict access to a damper for periodic inspection and testing, the damper shall be a single- or multiple-blade damper and shall comply with the remote inspection requirements of NFPA 80 or NFPA 105.”

## **Changes to Chapter 8 – Chimneys and Vents**

### 805.8 Insulation shield

Section 805.8 was added to the factory-built chimney section. It requires that factory-built chimneys that pass through insulated assemblies have an “insulation shield constructed of steel having a thickness of not less than 0.0187 inch” and “shall be installed to provide clearance between the chimney and the insulation material.” The installer must install the system according to the manufacturer’s installation instructions. “Where chimneys pass through attic space, the shield shall terminate not less than 2 inches (51 mm) above the insulation materials and shall be secured in place to prevent displacement.”

The excerpt below relays the exact wording of the requirements of this section.

#### **“805.8 Insulation shield.**

**Where factory-built chimneys pass through insulated assemblies, an insulation shield constructed of steel having a thickness of not less than 0.0187 inch (0.4712 mm) (No. 26 gage) shall be installed to provide clearance between the chimney and the insulation material. The clearance shall be not less than the clearance to combustibles specified by the chimney manufacturer’s installation instructions. Where chimneys pass through attic space, the shield shall terminate not less than 2 inches (51 mm) above the insulation materials and shall be secured in place to prevent displacement. Insulation shields provided as part of a listed chimney system shall be installed in accordance with the manufacturer’s instructions.”**

## **Changes to Chapter 9 – Specific Appliances, Fireplaces, and Solid Fuel-Burning Equipment**

### Section 929 Large-Diameter Ceiling Fans

Section 929 has been added to the 7th edition and requires that large-diameter ceiling fans meet AMCA 230 and UL 507 and be “installed in accordance with the manufacturer’s instructions.”

## Changes to Chapter 11 – Refrigeration

### 1105.6.3 Ventilation rate

In the machinery room section, the code has been updated to clarify that the emergency ventilation rate for ammonia is 30 air changes per hour, not the normal ventilation. While most of the section has not changed, reviewing all sections of 1105.6.3 is valuable. See excerpt below.

#### “1105.6.3 Ventilation rate.

For other than ammonia systems, the mechanical ventilation systems shall be capable of exhausting the minimum quantity of air both at normal operating and emergency conditions, as required by Sections 1105.6.3.1 and 1105.6.3.2. The minimum required **emergency ventilation rate for ammonia shall be 30 air changes per hour** in accordance with IIAR2. Multiple fans or multispeed fans shall be allowed to produce the emergency ventilation rate and to obtain a reduced airflow for normal ventilation.

##### 1105.6.3.1 Quantity—normal ventilation.

During occupied conditions, the mechanical ventilation system shall exhaust the larger of the following:

1. Not less than 0.5 cfm per square foot ( $0.0025 \text{ m}^3/\text{s} \cdot \text{m}^2$ ) of machinery room area or 20 cfm ( $0.009 \text{ m}^3/\text{s}$ ) per person.
2. A volume required to limit the room temperature rise to 18°F (10°C) taking into account the ambient heating effect of all machinery in the room.

##### 1105.6.3.2 Quantity—emergency conditions.

Upon actuation of the refrigerant detector required in Section 1105.3, the mechanical ventilation system shall exhaust air from the machinery room in the following quantity:

$$Q = 100 \times \sqrt{G} \quad (\text{Equation 11-2})$$

$$\text{For SI: } Q = 0.07 \times \sqrt{G}$$

where:

Q = The airflow in cubic feet per minute ( $\text{m}^3/\text{s}$ ).

G = The design mass of refrigerant in pounds (kg) in the largest system, any part of which is located in the machinery room.“

### 1107.5.2 Copper, brass and copper-alloy pipe

The list of allowable refrigerant relief piping materials has been expanded to include copper-alloy.

## Changes to Chapter 12 – Hydronic Piping

### TABLE 1202.5 Hydronic Pipe Fittings

ASSE 1061 has been added to allowable standard for copper, copper alloy, PE-RT, and PEX fittings.

#### 1208.1 General

Three exceptions have been added to the requirement to hydrostatically test hydronic piping “at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa).” The exceptions include “trap seal pull testing where a completed drainage, waste and vent system is vacuum tested with all of its traps filled with water, and the trap seals are tested with a vacuum typically between 1 and 2 inches of water column,” compressed air or gas testing for plastic piping, or compressed air or gas testing is included in the manufacturer’s written instructions.

See below for an excerpt from the 7th edition.

“1208.1 General.

Hydronic piping systems shall be tested hydrostatically at one and one-half times the maximum system design pressure, but not less than 100 psi (689 kPa). The duration of each test shall be not less than 15 minutes.

#### Exceptions:

1. With trap seal pull testing, where a completed drainage, waste and vent system is vacuum tested with all of its traps filled with water, and the trap seals are tested with a vacuum typically between 1 and 2 inches of water column.
2. For plastic piping systems specifically designed for use with compressed air or gas:
  - 2.1. The manufacturers’ instructions must be strictly followed for installation, visual inspection, testing and use of the systems and
  - 2.2. The use of compressed air or other gas testing is not prohibited by the authority having jurisdiction.
3. When compressed air or other gas pressure testing is specifically authorized by the applicable written instructions of the manufacturers of all plastic pipe and plastic pipe fittings products installed at the time the system is being tested and compressed air or other gas testing is not prohibited by the authority having jurisdiction.

The manufacturer should be contacted if there is any doubt as to how a specific system should be tested.”



## Changes to Chapter 14 – Solar Systems

### 1402.4 Roof-mounted collectors

The 7th edition clarifies that plastic solar collector covers shall be light-transmitting plastics.

## Changes to Chapter 15 – Referenced Standards

In general, the approved versions of the referenced standards have been updated. Pay particular attention to the following ASHRAE changes.

ASHRAE—2017	ASHRAE Fundamentals Handbook 603.2
15—2019	Safety Standard for Refrigeration Systems 1101.6, 1105.8, 1108.1
34—2019	Designation and Safety Classification of Refrigerants 202, 1102.2.1, 1103.1
62.1—2016	Ventilation for Acceptable Indoor Air Quality 403.3.1.1.2.3.2
170—2017	Ventilation of Health Care Facilities 407
ANSI/AMCA 210-ANSI/ASHRAE 51—07	Laboratory Methods of Testing Fans for Aerodynamic Performance Rating 403.3.2.4

Also review the changes to the NFPA versions. See below.

2—2016	Hydrogen Technologies Code 502.16.1
30A—18	Code for Motor Fuel-dispensing Facilities and Repair Garages 304.6
31—15	Standard for the Installation of Oil-burning Equipment 701.1, 801.2.1, 801.18.1, 801.18.2, 920.2, 922.1, 1308.1
37—18	Standard for the Installation and Use of Stationary

	Combustion Engines and Gas Turbines 915.1, 915.2
58—2017	Liquefied Petroleum Gas Code 502.9.10
70—2017	National Electrical Code 301.10, 306.3.1, 306.4.1, 306.5.2, 511.1.1, 513.12.2, 602.2.1.1, 927.2, 1104.2.2, 1106.3, 1106.4
72—16	National Fire Alarm and Signaling Code 606.3
80—16	Standard for Fire Doors and Other Opening Protectives 607.4.1.2
96—17	Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations 507.1
105—16	Standard for Smoke Door Assemblies and Other Opening Protectives 607.4.1.2
211—16	Standard for Chimneys, Fireplaces, Vents and Solid Fuel- burning Appliances 806.1
262—15	Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-handling Spaces 602.2.1.1
704—17	Standard System for Identification of the Hazards of Materials for Emergency Response 502.8.4, Table 1103.1, 510.1

References to codes in plans and specifications need to be consistent with the current Building Code.

### **General Changes**

#### UL to CSA

As the industry changes from UL to CSA listing, the code is allowing either listing.

### ARI to AHRI

References to ARI have been changed to AHRI to reflect the new name.

### **Conclusion**

While the objective of this course was to review the significant code changes in the 7th Edition (2020) update to the Florida Building Code: Mechanical as compared to the 6th Edition 2017 Florida Building Code: Mechanical, it does not include all changes. Reference the current code and the current referenced standards in implementing the code.

## References

- (ICC), I. (2017). 2017 Florida Building Code - Mechanical, 6th Edition. Retrieved January 13, 2021, from <https://codes.iccsafe.org/content/FMC2017>
- (ICC), I. (2020). 2020 Florida Building Code, Mechanical, 7th Edition. Retrieved January 13, 2021, from <https://codes.iccsafe.org/content/FLMC2020P1>

## Advanced Building Code – Mechanical – Quiz

Updated 2/16/2021

1. When does the 7<sup>th</sup> Edition of the Florida Building Code become effective?
  - a. January 1, 2020
  - b. June 1, 2020
  - c. December 31, 2020
  - d. January 1, 2021
  
2. What is maximum horizontal spacing required in the 7<sup>th</sup> edition for piping supports for 2" copper tubing?
  - a. 4 feet
  - b. 6 feet
  - c. 8 feet
  - d. 10 feet
  
3. True or False? Brass and copper alloy are possible condensate disposal system materials.
  - a. True
  - b. False
  
4. What is the required ventilation rate for warehouses?
  - a. 10 cfm/person only
  - b. 0.06 cfm/sqft only
  - c. 0.12 cfm/sqft only
  - d. 5 cfm/person and 0.12 cfm/sqft
  - e. 10 cfm/person and 0.06 cfm/sqft
  
5. The section in the 6<sup>th</sup> edition named, "Repair garages for natural gas- and hydrogen-fueled vehicles" has been renamed what in the 7<sup>th</sup> edition?
  - a. There was no name change
  - b. Repair garages
  - c. Repair garages for vehicles fueled by lighter than air fuels
  - d. None of the above
  
6. What is the minimum area for a dryer exhaust duct?
  - a. 10 square inches
  - b. 12 square inches
  - c. 12.5 square inches
  - d. 15 square inches

7. Cleanouts for hazardous ducts are required at the base of each vertical duct riser and at intervals not exceeding \_\_\_\_ feet in horizontal sections of duct?
  - a. 5
  - b. 10
  - c. 15 feet
  - d. 20 feet
  
8. True or False? Underground ducts do not need to be leak tested in the 7<sup>th</sup> edition.
  - a. True
  - b. False
  
9. Access doors for fire and smoke dampers must be at least \_\_\_\_ inches square?
  - a. 12 inches square
  - b. 16 inches square
  - c. 20 inches square
  - d. 25 inches square
  
10. Which version of ASHRAE Standard 15 is referenced in the 7<sup>th</sup> edition of the Florida Building Code - Mechanical?
  - a. 2012
  - b. 2015
  - c. 2019
  - d. 2020