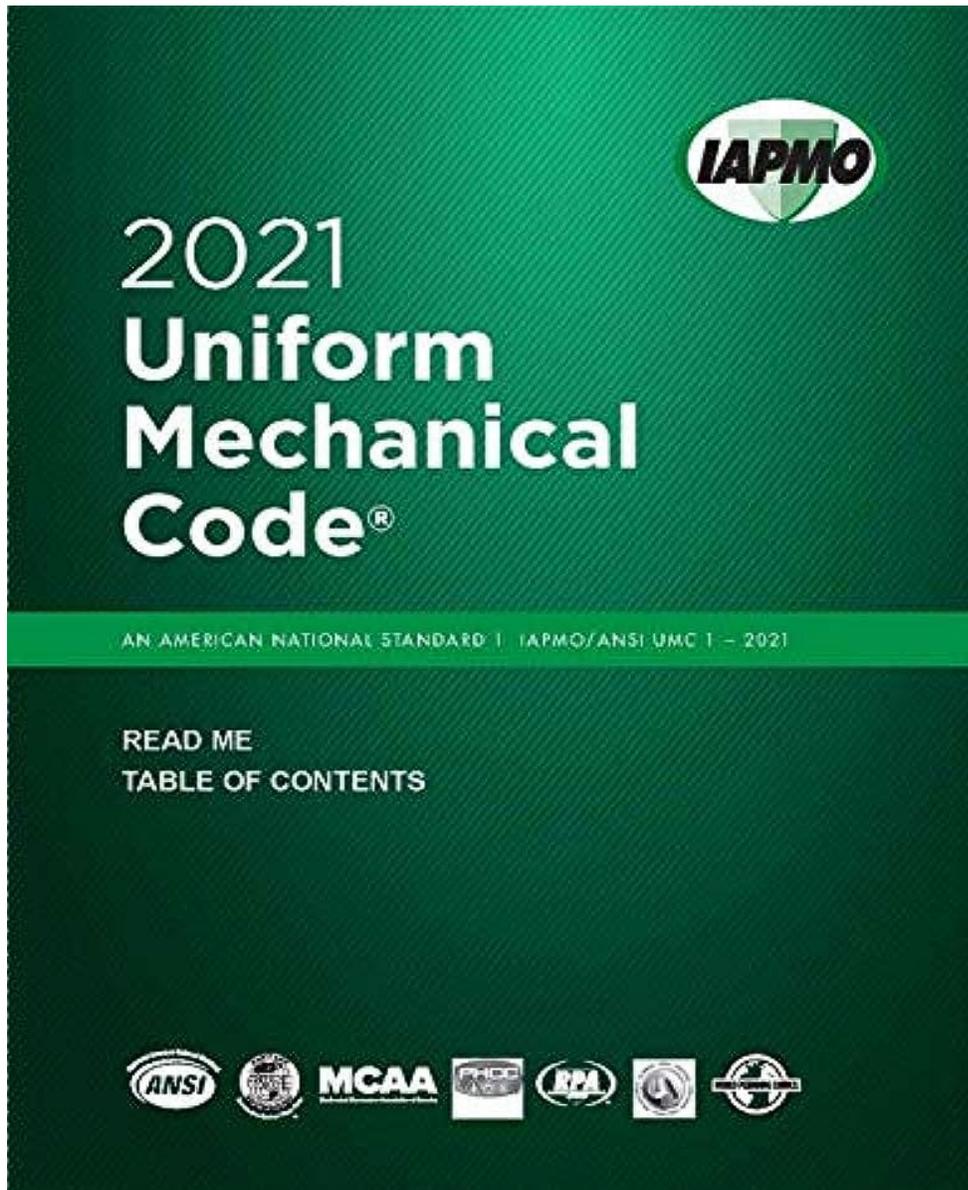




HOUSTON CONSTRUCTION CODE MODERNIZATION

**SIGNIFICANT CODE CHANGES &
HIGHLIGHTS OF THE 2015 TO
2018 AND 2018 TO 2021 UNIFORM
MECHANICAL CODE (UMC)**





2021 UNIFORM MECHANICAL CODE

Significant changes from 2015 to 2018 and 2018 to 2021 base code Uniform Mechanical Code

UMC CHAPTER 3 GENERAL REGULATIONS



CLEARANCE: 303.8.4 (2018 EDITION)

303.8.4 Clearance. Appliances shall be installed on a well-drained surface of the roof. At least 6 feet (1829 mm) of clearance shall be available between any part of the appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]

EDGE OF ROOF CLEARANCE: 303.8.4 (2021 EDITION)

303.8.4 Edge of Roof Clearance. Appliances shall be installed on a well-drained surface of the roof. At least 6 feet (1829 mm) of clearance shall be available between any part of the appliance and the edge of a roof or similar hazard, or rigidly fixed rails, guards, parapets, or other building structures at least 42 inches (1067 mm) in height shall be provided on the exposed side. [NFPA 54:9.4.2.2]

GUARDS AND RAILS: 303.8.4.1 (2021 EDITION)

- Addition of Section 303.8.4.1:
- 303.8.4.1 Guards and Rails. Guards or rails shall be required where the following exist:
 - (1) The clearance between the appliance and a roof edge or open end of an equipment platform is less than 6 feet (1829 mm).
 - (2) The open end of the equipment platform is located more than 30 inches (762 mm) above the roof, floor, or grade below.

Where guards or rails are installed, they shall be constructed so as to prevent the passage of a 21 inch (53 mm) diameter ball, resist the imposed loading conditions, and shall extend not less than 30 inches (762 mm) beyond each side of the equipment or appliance.

Exception: Guards shall not be required where a permanent fall arrest anchorage connector system in accordance with SSE Z539.1 is installed.

LOUVERS IN WINDBORNE DEBRIS REGIONS: 2021 HOUSTON AMENDMENT TO SECTION 315

- 315.0 Louvers in Windborne Debris Regions ~~Hurricane Prone Regions~~.
- 315.1 General. Louvers located in areas within hurricane-prone regions that are within 1 mile (2 km) of the coastal mean high water line where the basic wind speed is ~~130~~40 miles per hour (mi/h) (~~58.149.2~~ m/s) or more; or portions of hurricane-prone regions where the basic wind speed is ~~140~~20 mi/h (~~62.653.6~~ m/s) or more; or Hawaii, as described in ASCE 7 shall be tested in accordance with Section 315.1.1 and Section 315.1.2.
 - 315.1.1 Testing. Louvers that protect air intake or exhaust openings shall be tested in accordance with AMCA 550 for resistance to wind-driven rain.
 - 315.1.2 Impact Resistance Test. Upon request by the Authority Having Jurisdiction, louvers protecting intake and exhaust ventilation ducts that are not fixed in the open position and ~~located within 30 feet (9144 mm) of the grade~~ shall be tested for impact resistance in accordance with AMCA 540.
- 315.2 Louvers in Hurricane Prone Regions. Louvers that protect air intake or exhaust openings located in the Gulf of Mexico coasts where the basic wind speed for Risk Category II buildings is greater than 115 miles per hour (mi/h) (51.4 m/s) shall be tested in accordance with AMCA 550 for resistance to wind-drive rain.

UMC CHAPTER 4 VENTILATION AIR



APPLICABILITY: 2021 UMC 401.1

- Addition in Section 401.1
- 401.1 Applicability. This chapter contains requirements for ventilation air supply, exhaust, and makeup air requirements for occupiable spaces within the building. Spaces within buildings, except those within a dwelling unit in residential occupancies where occupants are nontransient, shall comply with Section 402.0 through Section 404.0. Requirements for ventilation ate for dwelling units in residential occupancies, where the occupants are nontransient, shall be in accordance with Section 405.0.

INDOOR AIR QUALITY FOR RESIDENTIAL OCCUPANCIES: 2021 UMC SECTION 405.0

- Addition of Sections 405.1 to 405.5:
(See 2021 UMC for detailed sections)
 - 405.1 General.
 - 405.1.1 Natural Ventilation.
 - 405.2 Ventilation Air Rate.
 - 405.2.1 Reduced Ventilation Air Rate.
 - 405.3 Bathroom Exhaust.
 - 405.3.1 Exhaust Rate.
 - 405.4 Kitchen Exhaust.
 - 405.4.1 Exhaust Rate.
 - 405.5 Ventilation Openings.

UMC CHAPTER 5 EXHAUST SYSTEMS



ENVIRONMENT AIR DUCTS: 502.2.1 (2018 EDITION)

- 502.2.1 Environmental Air Ducts. Environmental air duct exhaust shall terminate not less than 3 feet (914 mm) from a property line, 10 feet (3048 mm) from a forced air inlet, and 3 feet (914 mm) from openings into the building. Environmental exhaust ducts shall not discharge onto a public walkway.

ENVIRONMENT AIR DUCTS: 502.2.1 (2021 EDITION)

- Revision of Section 502.2.1:
- 502.2.1 Environmental Air Ducts. Environmental air duct exhaust shall terminate not less than 3 feet (914 mm) from a property line, 10 feet (3048 mm) from a forced air inlet, 10 feet (3048 mm) above a public walkway, and 3 feet (914 mm) from openings into the building. The discharge of environmental exhaust ducts shall not discharge be directed onto a public walkway.

FACTORY BUILT: 2021 UMC SECTION 507.4.4

- Addition of Sections 507.4.4.1, 507.4.4.2, and 507.4.4.3:
- 507.4.4.1 Listing. The factory-built grease duct protection system shall be listed in accordance with UL 2221. [NFPA 96:4.3.3.1]
- 507.4.4.2 Single Wall. Listed single wall factory-built grease ducts shall be permitted to be enclosed with field-applied grease duct enclosure material where the material and the assembly of duct and material are listed for that application and installed in accordance with the grease duct manufacturer's listing and their installation instructions. [NFPA 96:4.3.3.2]
- 507.4.4.3 Installation. The factory-built grease duct protection system shall be installed in accordance with the manufacturer's installation instructions and the listing requirements. [NFPA 96:4.3.3.3]

EXHAUST DUCT SYSTEMS: 510.0 (2018 EDITION)

- 510.1 General. Ducts shall not pass through fire walls. [NFPA 96:7.1.1]
 - 510.1.1 Fire Hazards. Ducts shall lead as directly to the exterior of the building, so as not to unduly increase a fire hazard. [NFPA 96:7.1.2]
 - 510.1.2 Interconnection. Duct systems shall not be interconnected with a building ventilation or exhaust system. [NFPA 96.7.1.3]
 - 510.1.3 Duct Installation. Ducts shall be installed with not less than 2 percent slope on horizontal runs up to 75 feet (22 860 mm) and not less than 8 percent slope on horizontal runs more than 75 feet (22 860 mm). Factory-built grease ducts shall be permitted to be installed in accordance with the listing and the manufacturer's installation instructions. Horizontal ducts shall be provided with access in accordance with Section 510.3.3. Drains shall be provided at low points in horizontal ducts. Where provided, drains shall be continuously welded to the exhaust duct or listed grease duct drains in accordance with the terms of the listing and the manufacturer's installation instructions. Ducts shall be installed without forming dips or traps. In manifold (common duct) systems, the lowest end of the main duct shall be connected flush on the bottom with the branch duct. [NFPA 96:7.1.4 – 7.1.4.5]

EXHAUST DUCT SYSTEMS: 510.0 CONTINUED (2018 EDITION)

- 510.1 General. Ducts shall not pass through fire walls. [NFPA 96:7.1.1]
 - ...
 - 510.1.4 Accessibility. Openings required for accessibility shall be in accordance with Section 510.3 through Section 510.3.2. [NFPA 96:7.1.5]
 - 510.1.5 Sign. A sign shall be placed on access panels stating the following:
ACCESS PANEL – DO NOT OBSTRUCT [NFPA 96:7.1.6]
 - 510.1.6 Bracing and Supports. Duct bracing and supports shall be of noncombustible material, securely attached to the structure and designed to carry gravity and lateral loads within the stress limitations of the building code. Bolts, screws, rivets, and other mechanical fasteners shall not penetrate duct walls.
 - 510.1.7 Type I Exhaust Duct Systems. Listed grease ducts shall be installed in accordance with the terms of their listings and manufacturer's installation instructions. [NFPA 96:7.1.7]

EXHAUST DUCT SYSTEMS: 510.0 (2021 EDITION)

- 510.1 General. Ducts shall not pass through fire walls. [NFPA 96:7.1.1]
 - 510.1.1 Fire Hazards. All ducts shall lead as directly to the exterior of the building, so as not to unduly increase a fire hazard. [NFPA 96:7.1.2]
 - 510.1.2 Interconnection. Duct systems shall not be interconnected with any other building ventilation or exhaust system. [NFPA 96.7.1.3]
 - 510.1.3 Duct Installation. Ducts shall be installed with ~~not less than~~ a minimum 2 percent slope on horizontal runs up to 75 feet (22 860 mm) and ~~not less than~~ a minimum 8 percent slope on horizontal runs ~~more than~~ greater than 75 feet (22 860 mm). Factory-built grease ducts shall be permitted to be installed at a lesser slope in accordance with the listing and the manufacturer's installation instructions. All horizontal ducts shall be provided with access in accordance with Section 510.3.3. Drains shall be provided at low points in horizontal ducts. Where provided, drains shall be continuously welded to the exhaust duct ~~or listed grease duct drains~~ in accordance with the terms of the listing and the manufacturer's installation ~~instructions~~ manual. All ducts shall be installed without forming dips or traps. In manifold (common duct) systems, the lowest end of the main duct shall be connected flush on the bottom with the branch duct. [NFPA 96:7.1.4 – 7.1.4.5]

EXHAUST DUCT SYSTEMS: 510.0 CONTINUED (2021 EDITION)

- 510.1 General. Ducts shall not pass through fire walls. [NFPA 96:7.1.1]
 - ...
 - 510.1.4 Accessibility. Openings required for accessibility shall be in accordance with Section 510.3 through Section 510.3.2. [NFPA 96:7.1.5]
 - 510.1.5 Sign. A sign stating the following shall be placed on all access panels ~~shall be placed on access panels stating the following:~~
 - ACCESS PANEL – DO NOT OBSTRUCT [NFPA 96:7.1.6]
 - 510.1.6 Bracing and Supports. Duct bracing and supports shall be of noncombustible material, securely attached to the structure and designed to carry gravity and lateral loads within the stress limitations of the building code. Bolts, screws, rivets, and other mechanical fasteners shall not penetrate duct walls.
 - 510.1.7 Type I Exhaust Duct Systems. Listed grease ducts shall be installed in accordance with the terms of their listings and manufacturer's ~~installation~~ instructions. [NFPA 96:7.1.7]

OTHER EQUIPMENT: 2021 UMC SECTION 512.3

- Addition of Sections 512.3.1, 512.3.2, and 512.3.3:
- 512.3.1 Access Required. Equipment shall have space provided to all access panels or doors for the safe removal and servicing of control devices, such as filters, electrostatic precipitator cells, and odor control media beds, and for cleaning of the equipment housing. [NFPA 96:9.3.1.3]
- 512.3.2 Downgrading. Downgrading other parts of the exhaust system due to the installation of approved devices, whether listed or not, shall not be allowed. [NFPA 96:9.3.2]
- 512.3.3 Fire-Extinguishing System. Any equipment installed in the path of exhaust products that provides secondary filtration or air pollution control shall be provided with an approved automatic fire-extinguishing system, installed in accordance with the fire extinguishing system manufacturer's instructions. [NFPA 96:9.3.3]
 - 512.3.3.1 Protection. The fire-extinguishing system required by Section 512.3.3 shall provide protection for the component sections of the equipment, and ductwork downstream of the equipment. [NFPA 96:9.3.3.1]
 - 512.3.3.2 Filter Media. Filter media used in secondary filtration or air pollution control units and not complying with Section 509.2.3 shall have fire protection that is adequate for the filter media being used in accordance with the fire-extinguishing system manufacturer's instructions. [NFPA 96:9.3.3.2]

OTHER EQUIPMENT: 2021 UMC SECTION 512.3

- Addition of Sections 512.3.4, 512.3.5, and 512.3.6:
- 512.3.4 Source of Ignition. If the equipment provides a source of ignition, it shall be provided with detection to operate the fire extinguishing system protecting the equipment. [NFPA 96:9.3.4]
- 512.3.5 Air Recirculation. Where a cooking exhaust system employs an air pollution control device that recirculates air into the building, the requirements of Section 516.0 shall apply. [NFPA 96:9.3.5]
- 512.3.6 Carbon Monoxide Required. If the heat source is non-electric and open flames are used, a carbon monoxide detector shall be installed in both the kitchen and dining areas. [NFPA 96:9.3.7]

UMC CHAPTER 6 DUCT SYSTEMS



INSTALLATION OF DUCTS: 2021 UMC SECTION 603.0

- Reorganization of Section 603.1 for clarification:
- 603.1 General. Air ducts shall be installed in accordance with this chapter and the installation instructions.
 - 603.1.1 Pressure Classification. The pressure classification of ducts shall be not less than the design operating pressure of the air distribution in which the duct is utilized.
 - 603.1.2 Air Temperature. The temperature of the air to be conveyed in a duct shall not exceed 250°F (121°C).
 - 603.1.3 Protection. Air ducts, other than plastic ducts, shall be installed with not less than 4 inches (102 mm) of separation from earth, except where installed as a liner inside of concrete, tile, or metal pipe and shall be protected from physical damage.
 - 603.1.4 Vertical Risers. Ducts listed and labeled to UL 181 shall not be used for vertical risers in air-duct systems serving more than two stories.
 - 603.1.5 Penetrations. Ducts listed and labeled to UL 181 shall not penetrate a fire-resistance-rated assembly or construction.

SUPPORT OF DUCTS: 2021 UMC SECTION 603.7

- Revisions of the following sections to Section 603.7:
(See 2021 UMC for detailed sections)
- 603.7 Support of Ducts. Ducts shall be supported accordance with the manufacturer's installation instructions; and Section 603.7.1, Section 603.7.2, or Section 603.7.3.
 - 603.7.1 Metal Ducts.
 - 603.7.1.1 Rectangular Ducts.
 - 603.7.1.2 Horizontal Round Ducts.
 - 603.7.1.3 Tight-Fitting Around the Perimeter.
 - 603.7.1.4 Sizes of Circular Bands.
 - 603.7.1.5 Connection.
 - 603.7.2 Flexible Air Ducts.
 - 603.7.3 Other Ducts.

UMC CHAPTER 9 INSTALLATION OF SPECIFIC APPLIANCES



COMPRESSED NATURAL GAS (CNG) VEHICULAR FUEL SYSTEMS: 2021 UMC SECTION 938.0

- Addition to Section 938.1:
- 938.1 General. The installation of compressed natural gas (CNG) fueling (dispensing) systems shall conform to NFPA 52. Residential CNG fueling appliances shall be listed in accordance with CSA NGV 5.1 and installed in accordance to the appliance manufacturer's installation instructions. [NFPA 54:10.28]

UMC CHAPTER 11 REFRIGERATION



PRESSURE-LIMITING DEVICES: 2021 UMC SECTION 1111.0

- Revision of Section 1111.1:
- 1111.1 Where Required. Pressure-limiting devices complying with Section 1111.2 through Section 1111.4 shall be provided for compressors on all systems operating above atmospheric pressure.

Exception: Pressure limiting devices are not required for listed Factory-sealed systems containing less than 22 pounds (9.9 kg) of Group A1 refrigerant ~~listed by an approved agency.~~ [ASHRAE 15:9.9.1]

PRESSURE-LIMITING DEVICES: 1111.0 CONTINUED

- Revision of Section 1111.2:
- ~~1111.2 Setting. Where required in Section 1111.1, the maximum setting to which a pressure-limiting device is capable of being readily set by use of the adjusting means provided shall not exceed the design pressure of the highside of a system that is not protected by a pressure-relief device or 90 percent of the setting of the pressure-relief device installed on the highside of a system. The pressure-limiting device shall stop the action of the pressure-imposing element at a pressure not more than the maximum setting. Exception: On systems using nonpositive displacement compressors, the maximum setting of the pressure-limiting device shall not be required to be less than the design pressure of the highside of the system provided the pressure-relief device is located in the lowside, subject to lowside pressure, and there is a permanent (unvalved) relief path between the highside and the lowside of the system.~~
- Pressure limiting devices shall be set in accordance with one the following:
- (1) For positive displacement compressors:
 - (a) When systems are protected by a highside pressure relief device, the compressor's pressure limiting device shall be set not more than 90 percent of the operating pressure for the highside pressure relief device.
 - (b) When systems are not protected by a highside pressure relief device, the compressor's pressure limiting device shall be set not more than the system's highside design pressure.
- (2) For nonpositive displacement compressors:
 - (a) When systems are protected by a highside pressure relief device, the compressor's pressure limiting device shall be set not more than 90 percent of the operating pressure for the highside pressure relief device.
 - (b) When systems are protected by a lowside pressure relief device that is only subject to lowside pressure, and is provided with a permanent relief path between the systems' highside and lowside, without intervening valves, the compressor's pressure limiting device shall be set not more than the systems' highside design pressure. [ASHRAE 15:9.9.2]

PRESSURE-LIMITING DEVICES: 1111.0 CONTINUED

- Revision of Sections 1111.3 and 1111.4:
- ~~1111.3 Connection Location. Pressure-limiting devices shall be connected between the pressure-imposing element and the stop valve on the discharge side. There shall be no intervening stop valves in the line leading to the pressure-limiting device. Stop valves shall not be installed between the pressure imposing element and pressure limiting devices serving compressors. [ASHRAE 15:9.9.3]~~
- ~~1111.4 Operation Emergency Stop. Where the system is protected by a pressure relief device, the pressure-limiting device shall stop the action of the pressure-imposing element at a pressure not exceeding 90 percent of the setting of the pressure-relief device. Activation of a pressure-limiting device shall stop the action of the pressure-imposing element. [ASHRAE 15:9.9.4]~~

PRESSURE-RELIEF DEVICES: 1112.0

- Revision of Section 1112.4:
- 1112.4 Evaporators. ~~Evaporators~~ Heat exchanger coils located downstream, or upstream within 18 inches (457 mm), of a heating coil source and capable of being isolated shall be fitted with a pressure-relief device ~~discharging~~ that discharges to another part of the system in accordance with Section 1112.5 through Section 1112.5.2 or outside the building any enclosed space in accordance with the requirements of Section 1112.10. The pressure relief device shall be connected at the highest possible location of the heat exchanger or piping between the heat exchanger and its manual isolation valves.

PRESSURE-RELIEF DEVICES: 1112.0 CONTINUED

- Revision of Section 1112.4:
- Exceptions:
 - (1) Relief valves shall not be required on ~~heating heat exchanger~~ coils that ~~are designed to produce a temperature that will result in the~~ have a design pressure more than 110 percent of refrigerant saturation pressure of the refrigerant being less than the design pressure when exposed to the maximum heating source temperature.
 - (2) A relief valve shall not be required on self-contained or unit systems where the volume of the lowside of the system, which is shut off by valves, is more than the specific volume of the refrigerant at critical conditions of temperature and pressure, as determined in accordance with Equation 1112.4.

$$V1 / [W1 - (V2 - V1) / Vgt] \geq \text{Shall be more than } Vgc \quad (\text{Equation 1112.4})$$

Where:

V1 = Lowside volume, cubic foot (m3).

V2 = Total volume of system, cubic foot (m3).

W1 = Total weight of refrigerant in system, pounds (kg).

Vgt = Specific volume of refrigerant vapor at 110°F (43°C), cubic feet per pound (m3/kg).

Vgc = Specific volume at critical temperature and pressure, cubic feet per pound (m3/kg). [ASHRAE 15:9.4.4]

HYDROSTATIC EXPANSION: 1112.5

- Addition of Sections 1112.5, 1112.5.1, and 1112.5.2:
- 1112.5 Hydrostatic Expansion. Pressure rise resulting from hydrostatic expansion due to temperature rise of liquid refrigerant trapped in or between closed valves shall be addressed in accordance with Section 1112.5.1 and Section 1112.5.2. [ASHRAE15:9.4.3]
- 1112.5.1 Hydrostatic Expansion During Normal Operation. Where trapping of liquid with subsequent hydrostatic expansion is capable of occurring automatically during normal operation or during standby, shipping, or power failure, engineering controls shall be used that are capable of preventing the pressure from exceeding the design pressure. Acceptable engineering controls include but are not limited to the following:
 - (1) Pressure relief device to relieve hydrostatic pressure to another part of the system.
 - (2) Reseating pressure relief valve to relieve the hydrostatic pressure to an approved treatment system. [ASHRAE 15:9.4.3.1]
- 1112.5.2 Hydrostatic Expansion During Maintenance. Where trapping of liquid with subsequent hydrostatic expansion is capable of occurring only during maintenance—i.e., when personnel are performing maintenance tasks—either engineering or administrative controls shall be used to relieve or prevent the hydrostatic overpressure. [ASHRAE 15:9.4.3.2]

UMC CHAPTER 12 HYDRONICS



SIMULTANEOUS OPERATION, TEMPERATURE READING: 2021 UMC SECTIONS 1213.4, 1213.5

- Addition of Sections 1213.4 and 1213.5:
- 1213.4 Simultaneous Operation. Radiant heating and cooling systems sharing a common space temperature control shall be configured to prevent simultaneous heating and cooling.
- 1213.5 Temperature Reading. A temperature gauge or transmitter shall be installed for reading the fluid temperatures in the panel system supply and heat source outlet. One temperature gauge or transmitter shall be permitted where the temperature between the heat source outlet and panel system supply are the same.

TYPES OF TUBE FASTENERS: 2021 UMC SECTION 1217.5.3

- Addition of Section 1217.5.3:
- 1217.5.3 Types of Tube Fasteners. Tubing that is embedded within concrete shall be fastened according to manufacturer's instructions. Unless prohibited by the manufacturer, tube fasteners include the following:
 - (1) Ties made of wire, typically fastened to anchors such as rebar or wire mesh.
 - (2) Plastic tube/cable ties, typically nylon, fastened to anchors such as rebar or wire mesh.
 - (3) Staples made of metal or plastic or combination thereof, without sharp edges that would harm tube, fastened to insulation or subfloor.
 - (4) Plastic rails with integrated tube holders intended for the specific type of tube.
 - (5) Insulation sheets with integrated knobs for holding the specific type of tube and intended for this application.
 - (6) Other fasteners recommended by the manufacturer.

SPACING OF TUBE FASTENERS: 2021 UMC SECTION 1217.5.4

- Addition of Section 1217.5.4:
- 1217.5.4 Spacing of Tube Fasteners. The maximum spacing between tube fasteners within a concrete floor shall not exceed the spacing specified by the manufacturer or, in the absence of manufacturer's specifications, 2.5 feet (762 mm).

JOIST SYSTEMS AND SUBFLOORS: 2021 UMC SECTION 1217.6

- Addition of Section 1217.6.1:
- 1217.6.1 Tubing Fasteners. Tubing that is installed within joist spaces and subfloor panel systems shall be fastened according to manufacturer's instructions. Unless prohibited by the manufacturer, tubing fasteners shall include the following:
 - (1) Heat transfer panel systems made of wood, aluminum or other thermally conductive materials intended for this application and the specific type of tube.
 - (2) Staples made of metal or plastic or combination thereof, without sharp edges that would harm tube, intended for this application and the specific type of tube fastened to subfloor.
 - (3) Plastic rails with integrated tube holders intended for the specific type of tube.
 - (4) Other fasteners recommended by the manufacturer.

UMC CHAPTER 13 FUEL GAS PIPING



OVERPRESSURE PROTECTION DEVICES: 2021 UMC SECTION 1308.10

- Addition of Sections 1308.10 and 1308.10.1:
- 1308.10 Overpressure Protection Devices. Overpressure protection devices shall be one of the following:
 - (1) Pressure relief valve.
 - (2) Monitor regulator.
 - (3) Series regulator installed upstream from the line regulator and set to continuously limit the pressure on the inlet of the line regulator to the maximum values specified by Section 1308.9 or less.
 - (4) Automatic shutoff device installed in series with the line pressure regulator and set to shut off when the pressure on the downstream piping system reaches the maximum values specified by Section 1308.9 or less. This device shall be designed so that it will remain closed until manually reset. [NFPA 54:5.9.3.1]
- 1308.10.1 Separate Devices. The devices in Section 1308.10 shall be installed either as an integral part of the service or line pressure regulator or as separate units. Where separate overpressure protection devices are installed, they shall comply with Section 1308.10.2 through Section 1308.10.7. [NFPA 54:5.9.3.2]

OVERPRESSURE PROTECTION DEVICES: 2021 UMC SECTION 1308.10

- Addition of Sections 1308.10.2, 1308.10.3, and 1308.10.4:
- 1308.10.2 Construction and Installation. All overpressure protection devices shall meet the following requirements:
 - (1) Be constructed of materials so that the operation of the device is not impaired by corrosion of external parts by the atmosphere or of internal parts by the gas.
 - (2) Be designed and installed so they can be operated to determine whether the valve is free. The devices shall also be designed and installed so they can be tested to determine the pressure at which they operate and be examined for leakage when in the closed position. [NFPA 54:5.9.4]
- 1308.10.3 External Control Piping. External control piping shall be designed and installed so that damage to the control piping of one device does not render both the regulator and the overpressure protective device inoperative. [NFPA 54:5.9.5]
- 1308.10.4 Setting. Each pressure limiting or pressure relieving device shall be set so that the gas pressure supplied to the connected appliance(s) does not exceed the limits specified in Section 1308.9 and Section 1308.9.1. [NFPA 54:5.9.6]

OVERPRESSURE PROTECTION DEVICES: 2021 UMC SECTION 1308.10

- Addition of Sections 1308.10.5 and 1308.10.7:
- 1308.10.5 Unauthorized Operation. Where unauthorized operation of any shutoff valve could render a pressure relieving valve or pressure limiting device inoperative, one of the following shall be accomplished:
 - (1) The valve shall be locked in the open position. Instruct authorized personnel in the importance of leaving the shutoff valve open and of being present while the shutoff valve is closed so that it can be locked in the open position before leaving the premises.
 - (2) Duplicate relief valves shall be installed, each having adequate capacity to protect the system, and arrange the isolating valves or three-way valve so that only one relief valve can be rendered inoperative at a time. [NFPA 54:5.9.7]
- 1308.10.7 Size of Fittings, Pipe, and Openings. The fittings, pipe, and openings located between the system to be protected and the pressure relieving device shall be sized to prevent hammering of the valve and to prevent impairment of relief capacity. [NFPA 54:5.9.9]

SIZING OF GAS PIPING SYSTEMS: 2021 UMC SECTION 1315.2

- Revision of Section 1315.2 and addition of Sections 1315.2.1 and 1315.2.2:
- ~~1315.2 Tables for Sizing Gas Piping Systems. Table 1315.2(1) through Table 1315.2(36) shall be used to size gas piping in conjunction with one of the methods described in Section 1315.1.1 through Section 1315.1.3. [NFPA 54:6.2]~~
- 1315.2 Sizing of Gas Piping Systems. Sizing of piping systems shall be in accordance with Section 1315.2.1 for natural gas piping system and Section 1315.2.2 for propane piping systems.
 - 1315.2.1 Natural Gas Piping Systems. Table 1315.2(1) through Table 1315.2(23) shall be used in conjunction with one of the methods described in Section 1315.1.1 through Section 1315.1.3 for piping materials other than non-corrugated stainless steel tubing. Section 1315.3 shall be used in conjunction with one of the methods described in Section 1315.1.1 through Section 1315.1.3 for non-corrugated stainless steel tubing. [NFPA 54:6.2.1, 6.2.2]
 - 1315.2.2 Propane Piping Systems. Table 1315.2(24) through Table 1315.2(36) shall be used in conjunction with one of the methods described in Section 1315.1.1 through Section 1315.1.3 for piping materials other than non-corrugated stainless steel tubing. Section 1315.3 shall be used in conjunction with one of the methods described in Section 1315.1.1 through Section 1315.1.3 for non-corrugated stainless steel tubing. [NFPA 54:6.3.1, 6.3.2]

UMC APPENDIX F GEOTHERMAL ENERGY SYSTEMS

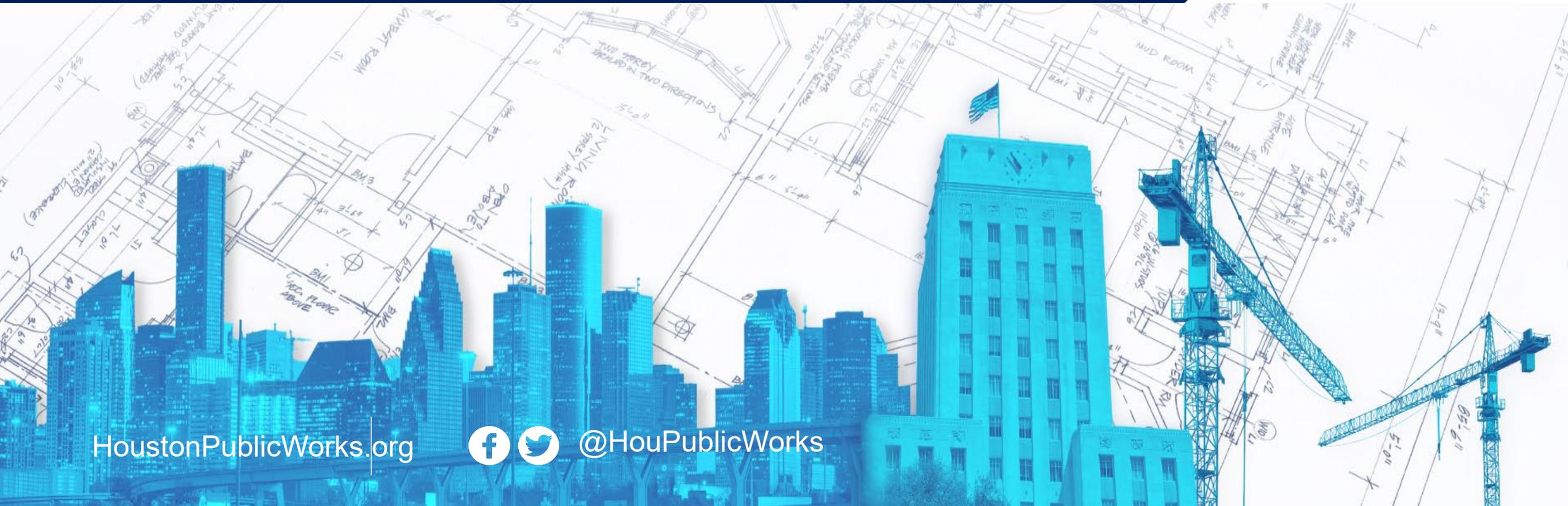


GEOHERMAL ENERGY SYSTEMS: 2021 UMC APPENDIX F

- Addition of entire Appendix F section split into 4 parts:
(See 2021 UMC for detailed sections)
- Part I – General: F101.0 – F110.1
- Part II – Closed Loop Systems: F201.0 – F202.4
- Part III – Open Loop Systems: F301.0 – F303.7
- Part IV – Direct Exchange (DX) Systems: F401.0 – F401.8



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