**Supplement to the 8th Edition (2023) FBC, Mechanical**

**Note 1**: Throughout the document, change International Building Code to Florida Building Code, Building; Energy Conservation Code tothe Florida Building Code, Energy Conservation; change the International Existing Building Code to Florida Building Code, Existing Building; change the International Fire code to Florida Fire Prevention Code; change International Fuel Gas Code to Florida Building Code, Fuel Gas; change the International Mechanical Code to Florida Building Code, Mechanical; change the International Plumbing Code to Florida Building Code, Plumbing; change the International Residential Code to Florida Building Code, Residential.

**CHAPTER 2 DEFINITIONS**

**[BG] AMBULATORY CARE FACILITY**

Buildings or portions thereof used to provide medical, surgical, psychiatric, nursing or similar care on a less than 24-hour basis to persons who are rendered incapable of self-preservation by the services provided or staff has accepted responsibility for care recipients already incapable.

(M10928 / G3-21 Part IV AS)

**NONCOMBUSTIBLE MATERIAL~~S~~.** A material that passes ASTM E136. ~~Materials that, when tested in accordance with ASTM E136, have~~ ~~not fewer than three of four specimens tested meeting all of the following criteria:~~

1. ~~The recorded temperature of the surface and interior thermocouples shall not at any time during the test rise more than 54ºF (30ºC)~~ ~~above the furnace temperature at the beginning of the test.~~

2. ~~There shall not be flaming from the specimen after the first 30 seconds~~.

3. ~~If the weight loss of the specimen during testing exceeds 50 percent, the recorded temperature of the surface and interior~~ ~~thermocouples shall not at any time during the test rise above the furnace air temperature at the beginning of the test, and there~~ ~~shall not be flaming of the specimen.~~

(M11266 / M6-21 AS)

Delete and substitute as follows:

**~~REFRIGERANT~~.** ~~A substance utilized to produce refrigeration by its expansion or vaporization~~.

**REFRIGERANT.**

The fluid used for heat transfer in a refrigeration system that undergoes a change of state to absorb heat

(M11267 / M8-21 Part I AS)

**REFRIGERATION ~~REFRIGERATING~~ SYSTEM**

A combination of interconnected parts in which a refrigerant is enclosed and ~~refrigerant-containing parts constituting one closed refrigerant~~ ~~circuit in which a refrigerant~~ is circulated for the purpose of extracting then rejecting heat.

(M11289 / M10-21 Part I AS)

**STEAM BATH EQUIPMENT**

Includes steam bath generators, combination room and steam generator systems, and steam bath cabinets intended for high-humidity concentrated heating at elevated temperatures for personal bathing

(M11327 / M62-21 AS)

**DRAFTSTOP**

**.**

A material, device or construction installed to restrict the movement of air within open spaces of concealed areas of building components such as crawl spaces, floor/ceiling assemblies, roof/ceiling assemblies and attics.

(M11228 / FS47-21 Part III AS)

**CONDENSING UNIT.** ~~A specific refrigerating machine combination for a given refrigerant, consisting of one or more power-driven~~ ~~compressors, condensers and, where required, liquid receivers, and the regularly furnished accessories.~~

A factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. The unit consists of one or more power-driven compressors, condensers, liquid receivers (where required) and factory-supplied accessories.

(M11232 / M2-21 AS)

**GYPSUM BOARD**

**.** A type of gypsum panel product consisting of a noncombustible core primarily of gypsum with paper surfacing.

**GYPSUM WALLBOARD**

A gypsum board used primarily as an interior surfacing for building structures.

(M11233 / M3-21 AS)

**~~HEAT PUMP~~.** ~~A refrigeration system that extracts heat from one substance and transfers it to another portion of the same substance or to a~~ ~~second substance at a higher temperature for a beneficial purpose.~~

**HEAT PUMP.**

A refrigeration system or factory-made appliance that utilizes refrigerant to transfer heat into a space or substance.

(M11235 / M4-21 Part I AS)

**LOWER FLAMMABLE LIMIT (REFRIGERANT) (LFL).** The minimum concentration of refrigerant ~~that is~~ at which a flame is capable of propagating ~~a flame~~ through a homogeneous mixture of refrigerant and air under specific test conditions in accordance with ASHRAE 34.

(M11239 / M5-21 AS)

**Revise as follows:**

**[A] LISTED.** Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or

services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose. Terms that are used to identify listed equipment, products, or materials include “listed”, “certified”, “classified” or other

terms as determined appropriate by the listing organization.

(M10930 / ADM1-22 Part I AS)

**GREASE DUCT**

**.**

A duct serving a Type I hood, or cooking appliances equipped with integral down-draft exhaust systems that produce grease, to convey grease-laden air from the hood or cooking appliance directly to the outdoors.

(M11308 / M35-21 AS)

Add new definition as follows:

**Refrigerant Designation.** The unique identifying alphanumeric value or refrigerant number assigned to an individual refrigerant and published in ASHRAE Standard 34.

(M11369 / M73-21 AMPC1)

**CHAPTER 3 GENERAL REGULATIONS**

Committee modification -

**[BS]302.5 Cutting, and notching ~~and boring~~ in cold-formed steel framing.** The cutting, and notching ~~and boring of~~ holes in cold-formed steel framing members shall be in accordance with AISI S240 for structural members and AISI S220 for non-structural members. ~~The~~ ~~cutting, notching and boring of steel framing members shall comply with Sections 302.5.1 through 302.5.3.~~

**(P11086/S196-22)**

**[BS] 302.3 Cutting, notching and boring in wood framing.** The cutting, notching and boring of wood framing members shall comply with Sections 2301.4.1 of the *Florida Building Code, Building*. ~~302.3.1 through 302.3.4~~.

**~~Delete without substitution:~~**

**~~[BS] 302.3.1 Joist notching.~~** ~~Notches on the ends of joists shall not exceed one-fourth the joist depth. Holes bored in joists shall not be within 2 inches (51 mm) of the top or bottom of the joist, and the diameter of any such hole shall not exceed one-third the depth of the joist. Notches in the top or bottom of joists shall not exceed one-sixth the depth and shall not be located in the middle third of the span.~~

**~~[BS] 302.3.2 Stud cutting and notching.~~** ~~In exterior walls and bearing partitions, a wood stud shall not be cut or notched in excess of 25 percent of its depth. In nonbearing partitions that do not support loads other than the weight of the partition, a stud shall not be cut or notched in excess of 40 percent of its depth.~~

**~~[BS] 302.3.3 Bored holes.~~** ~~The diameter of bored holes in wood studs shall not exceed 40 percent of the stud depth. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in nonbearing partitions. The diameter of bored holes in wood studs shall not exceed 60 percent of the stud depth in any wall where each stud is doubled, provided that not more than two such successive doubled studs are so bored. The edge of the bored hole shall be not closer than~~ ~~5~~~~/~~~~8~~ ~~inch (15.9 mm) to the edge of the stud. Bored holes shall be not located at the same section of stud as a cut or notch.~~

(M11451 / S224-22 AS)

**TABLE 305.4 PIPING SUPPORT SPACINGa**

|  |  |  |
| --- | --- | --- |
| **PIPING MATERIAL** | **MAXIMUM HORIZONTAL SPACING (feet)** | **MAXIMUM VERTICAL SPACING (feet)** |
| ABS pipe | 4 | 10c |
| Aluminum pipe and tubing | 10 | 15 |
| Cast-iron pipeb | 5 | 15 |
| Copper or copper-alloy pipe | 12 | 10 |
| Copper or copper-alloy tubing | 8 | 10 |
| CPVC pipe or tubing, 1 inch and smaller | 3 | 10c |
| CPVC pipe or tubing, 11/4-inches and larger | 4 | 10c |
| Lead pipe | Continuous | 4 |
| ~~PB pipe or tubing~~ | ~~22/3 (32 inches)~~ | 4 |
| PE-RT 1 inch and smaller | 22/3 (32 inches) | 10c |
| PE-RT 11/4 inches and larger | 4 | 10c |
| PEX tubing 1 inch and smaller | 22/3 (32 inches) | 10c |
| PEX tubing 11/4 inches and larger | 4 | 10c |
| Polypropylene (PP) pipe or tubing, 1 inch and smaller | 22/3 (32 inches) | 10c |
| Polypropylene (PP) pipe or tubing, 11/4 inches and larger | 4 | 10c |
| PVC pipe | 4 | 10c |
| Steel pipe | 12 | 15 |
| Steel tubing | 8 | 10 |

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. See Section 301.18.

b. The maximum horizontal spacing of cast-iron pipe hangers shall be increased to 10 feet where 10-foot lengths of pipe are installed.

c. Mid-story guide.

(M11291 / M12-21 AS)

**306.1 Access.** *Appliances*, controls devices, heat exchangers and HVAC system components that utilize energy shall~~be accessible~~ provide access for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the *appliance* being inspected, serviced, repaired or replaced. A level working space not less than 30 inches deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an *appliance*.

(M11229 / G1-21 Part V AS)

**306.5 Equipment and appliances on roofs or elevated structures.** Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over

obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall. Permanent ladders installed to provide the required access shall comply with the following minimum design criteria:

1. The side railing shall extend above the parapet or roof edge or landing platform not less than ~~30 inches (762 mm~~). 42 inches (1067 mm)

2. Ladders shall have rung spacing not less than 10 inches ( 254 mm) and not to exceed 14 inches (356 mm) on center. The uppermost rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable.

3. Ladders shall have a toe spacing not less than~~6 inches (152 mm)~~ 7 inches (178 mm) and not more than 12 inches (305 mm) deep

4. There shall be not less than~~18 inches (457 mm)~~ 16 inches ( 406 mm) between rails.

5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load.

6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the ladder served. A guard rail shall be provided on all open sides of the landing.

7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed.

8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder.

9. Ladders shall be protected against corrosion by *approved* means.

10. Access to ladders shall be provided at all times.

11. Top landing required. The ladder shall be provided with a clear and unobstructed landing on the exit side of the roof hatch having a minimum space of 30 inches deep and be of the same width as the hatch.

Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.

**Exception:** This section shall not apply to Group R-3 *occupancies*.

(M11292 / M13-21 AM)/ (M11293 / M14-21 AS)

**CHAPTER 4 VENTILATION**

**401.4 Intake opening location.** Air intake openings shall comply with all of the following:

1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot.

2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys, parking lots and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking lots and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.

3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where a~~n approved~~ factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the *fan* manufacturer's instructions.

4. No change

(M11294 / M16-21 AMPC1)

**403.3.1 Other buildings intended to be occupied.** The design of local exhaust systems and ventilation systems for outdoor air for *occupancies* other than Group R-2, R-3 and R-4 ~~three stories and less above grade plane~~ shall comply with Sections 403.3.1.1 through 403.3.1.4.

**403.3.2 Group R-2, R-3 and R-4 occupancies~~, three stories and less~~.** The design of local exhaust systems and ventilation systems for outdoor air in Group R-2, R-3 and R-4 *occupancies* ~~three stories and less in height above grade plane~~ shall comply with Sections 403.3.2.1 through 403.3.2.5.

**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.

QOA= ~~0.01~~ 0.03 Afloor +7.5(Nbr+1)

where:

*QOA*= outdoor airflow rate, cfm

*Afloor* = conditioned floor area, ft2

*Nbr* = 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 airflow 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:

A ducted system supplies ventilation air directly to each bedroom and to one or more of the following rooms:

Living room.

Dining room.

Kitchen.

The whole-house ventilation system is a *balanced ventilation* system.

(M11295 / M19-21 AM)

**TABLE 403.3.1.1 MINIMUM VENTILATION RATES**

**Portions of table not shown remain unchanged.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OCCUPANCY CLASSIFICATION** | **OCCUPANT DENSITY**  **#/1000 FT 2 a** | **PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, *R p* CFM/PERSON** | **AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE,**  ***R a* CFM/FT 2 a** | **EXHAUST AIRFLOW RATE CFM/FT 2 a** |
| **Public spaces** |  |  |  |  |
| Corridors | — | — | 0.06 | — |
| Courtrooms | 70 | 5 | 0.06 | — |
| Elevator car | — | — | — | 1.0 |
| Legislative chambers | 50 | 5 | 0.06 | — |
| Libraries | 10 | 5 | 0.12 | — |
| Museums (children’s) | 40 | 7.5 | 0.12 | — |
| Museums/galleries | 40 | 7.5 | 0.06 | — |
| Places of religious worship | 120 | 5 | 0.06 | — |
| Shower room (per shower head) g | — | — | — | 50/20 f |
| Smoking lounges b | 70 | 60 | — | — |
| Toilet rooms — public g | — | — | — | 50/70 e |
| Room with adult changing |  |  | , | 50/70e |
| station |

For SI: 1 cubic foot per minute = 0.0004719 m3 /s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m 3 /(s • m 2 ), °C = [(°F) – 32]/1.8, 1 square foot = 0.0929 m 2 .

a. Based on *net occupiable floor area.*

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404.

e. Rates are per water closet, ~~or~~ urinal or adult changing station. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited. For occupancies other than science laboratories, where there is a wheel - type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20 Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

(M11296 / M20-21 AS)

**TABLE 403.3.1.1 MINIMUM VENTILATION RATES**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OCCUPANCY CLASSIFICATION** | **OCCUPANT DENSITY #/1000 FT 2 a** | **PEOPLE OUTDOOR AIRFLOW RATE IN**  **BREATHING ZONE, *R p* CFM/PERSON** | **AREA OUTDOOR AIRFLOW RATE IN**  **BREATHING ZONE, *R a* CFM/FT 2 a** | **EXHAUST AIRFLOW** |
| **RATE CFM/FT 2 a** |
| **Animal Facilities** |  |  |  |  |
| Animal exam room (veterinary office) | 20 | 10 | 0.12 | - |
| Animal imaging (MRI/CT/PET) | 20 | 10 | 0.18 | 0.9 |
| Animal operating rooms | 20 | 10 | 0.18 | 3.00 |
| Animal postoperative recovery room | 20 | 10 | 0.18 | 1.50 |
| Animal preparation rooms | 20 | 10 | 0.18 | 1.50 |
| Animal procedure room | 20 | 10 | 0.18 | 2.25 |
| Animal surgery scrub | 20 | 10 | 0.18 | 1.50 |
| Large-animal holding room | 20 | 10 | 0.18 | 2.25 |
| Necropsy | 20 | 10 | 0.18 | 2.25 |
| Small-animal cage room (static cages) | 20 | 10 | 0.18 | 2.25 |
| Small-animal-cage room (ventilated cages) | 20 | 10 | 0.18 | 1.50 |
| **Correctional facilities** |  |  |  |  |
| Booking/waiting | 50 | 7.5 | 0.06 | — |
| Cells without plumbing fixtures with plumbing fixtures g | 25  25 | 5  5 | 0.12  0.12 | —  1.0 |
| Day room | 30 | 5 | 0.06 | — |
| Dining halls (see “Food and beverage service”) | — | — | — | — |
| Guard stations | 15 | 5 | 0.06 | — |
| **Dry cleaners, laundries** |  |  |  |  |
| Coin-operated dry cleaner | 20 | 15 | — | — |
| Coin-operated laundries | 20 | 7.5 | 0.12 | — |
| Commercial dry cleaner | 30 | 30 | — | — |
| Commercial laundry | 10 | 5 | 0.12 | — |
| Storage, pick up | 30 | 7.5 | 0.12 | — |
| **Education** |  |  |  |  |
| Art classroom g | 20 | 10 | 0.18 | 0.7 |
| Auditoriums | 150 | 5 | 0.06 | — |
| Classrooms (ages 5–8) | 25 | 10 | 0.12 | — |
| Classrooms (age 9 plus) | 35 | 10 | 0.12 | — |
| Computer lab | 25 | 10 | 0.12 | — |
| Corridors (see “Public spaces”) | — | — | — | — |
| Day care (through age 4) | 25 | 10 | 0.18 | — |
| Lecture classroom | 65 | 7.5 | 0.06 | — |
| Lecture hall (fixed seats) | 150 | 7.5 | 0.06 | — |
| Locker/dressing rooms g | — | — | — | 0.25 |
| Media center | 25 | 10 | 0.12 | — |
| Multiuse assembly | 100 | 7.5 | 0.06 | — |
| Music/theater/dance | 35 | 10 | 0.06 | — |
| Science laboratories g | 25 | 10 | 0.18 | 1.0 |
| Smoking loungesb | 70 | 60 | — | — |
| Sports locker rooms g | — | — | — | 0.5 |
| Wood/metal shops g | 20 | 10 | 0.18 | 0.5 |
| **Food and beverage service** |  |  |  |  |
| Bars, cocktail lounges | 100 | 7.5 | 0.18 | — |
| Break rooms | 25 | 5 | 0.06 | - |
| Cafeteria, fast food | 100 | 7.5 | 0.18 | — |
| Coffee stations | 20 | 5 | 0.06 | - |
| Corridors | - | - | 0.06 | - |
| Dining rooms | 70 | 7.5 | 0.18 | — |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OCCUPANCY CLASSIFICATION** | **OCCUPANT DENSITY**  **#/1000 FT** | **PEOPLE OUTDOOR AIRFLOW RATE IN**  **BREATHING ZONE, *R* CFM/PERSON** | **AREA OUTDOOR AIRFLOW RATE IN**  **BREATHING ZONE, *R* CFM/FT** | **EXHAUST AIRFLOW** |
| **RATE CFM/FT** |
| Kitchens (cooking) b | 20 | 7.5 | 0.12 | 0.7 |
| Occupiable storage rooms for liquids or gels | 2 | 5 | 0.12 | - |
| **Hotels, motels, resorts and dormitories** |  |  |  |  |
| Bathrooms/toilet—private g | — | — | — | 25/50 f |
| Bedroom/living room | 10 | 5 | 0.06 | — |
| Conference/meeting | 50 | 5 | 0.06 | — |
| Dormitory sleeping areas | 20 | 5 | 0.06 | — |
| Gambling casinos | 120 | 7.5 | 0.18 | — |
| Laundry rooms, central | 10 | 5 | 0.12 | - |
| Laundry rooms within dwelling units | 10 | 5 | 0.12 | - |
| Lobbies/prefunction | 30 | 7.5 | 0.06 | — |
| Multipurpose assembly | 120 | 5 | 0.06 | — |
| **Offices** |  |  |  |  |
| Break rooms | 50 | 5 | 0.12 | - |
| Conference rooms | 50 | 5 | 0.06 | — |
| Main entry lobbies | 10 | 5 | 0.06 | — |
| Occupiable storage rooms for dry materials | 2 | 5 | 0.06 | - |
| Office spaces | 5 | 5 | 0.06 | — |
| Reception areas | 30 | 5 | 0.06 | — |
| Telephone/data entry | 60 | 5 | 0.06 | — |
| **Outpatient healthcare facilitiesi, j** |  |  |  |  |
| Birthing room | 15 | 10 | 0.18 | - |
| Class 1 imaging room | 5 | 5 | 0.12 | - |
| Dental operatoryk | 20 | 10 | 0.18 | - |
| General examination room | 20 | 7.5 | 0.12 | - |
| Other dental treatment areas | 5 | 5 | 0.06 | - |
| Physical therapy exercise area | 7 | 20 | 0.18 | - |
| Physical therapy individual room | 20 | 10 | 0.06 | - |
| Physical therapeutic pool area | - | - | 0.48 | - |
| Prosthetics and orthotics room | 20 | 10 | 0.18 | - |
| Psychiatric consultation room | 20 | 5 | 0.06 | - |
| Psychiatric examination room | 20 | 5 | 0.06 | - |
| Psychiatric group room | 50 | 5 | 0.06 | - |
| Psychiatric seclusion room | 5 | 10 | 0.06 | - |
| Speech therapy room | 20 | 5 | 0.06 | - |
| Urgent care examination room | 20 | 7.5 | 0.12 | - |
| Urgent care observation room | 20 | 5 | 0.06 | - |
| Urgent care treatment room | 20 | 7.5 | 0.18 | - |
| Urgent care triage room | 20 | 10 | 0.18 | - |
| **Private dwellings, single and multiple** |  |  |  |  |
| Garages, common for multiple units b | — | — | — | 0.75 |
| Kitchens b | — | — | — | 50 /100 f |
| Living areas c | Based on number of bedrooms. First  bedroom, 2; each additional bedroom, 1 | 0.35 ACH but not less than 15 cfm/person | — | — |
| Toilet rooms and bathrooms g | — | — | — | 25 /50 f |
| **Public spaces** |  |  |  |  |
| Corridors | — | — | 0.06 | — |
| Courtrooms | 70 | 5 | 0.06 | — |
| Elevator car | — | — | — | 1.0 |
| Legislative chambers | 50 | 5 | 0.06 | — |
| Libraries | 10 | 5 | 0.12 | — |
| Museums (children’s) | 40 | 7.5 | 0.12 | — |
| Museums/galleries | 40 | 7.5 | 0.06 | — |
| Places of religious worship | 120 | 5 | 0.06 | — |
| Shower room (per shower head) g | — | — | — | 50/20 f |
| Smoking lounges b | 70 | 60 | — | — |
| Toilet rooms — public g | — | — | — | 50/70 e |
| **Retail stores, sales floors and showroom floors** |  |  |  |  |
| Dressing rooms | — | — | — | 0.25 |
| Mall common areas | 40 | 7.5 | 0.06 | — |
| Sales | 15 | 7.5 | 0.12 | — |
| Shipping and receiving | 2 | 10 | 0.12 | — |
| Smoking lounges b | 70 | 60 | — | — |
| Storage rooms | — | — | 0.12 | — |
| Warehouses (see “Storage”) | — | 10 | 0.06 | — |
| **Specialty shops** |  |  |  |  |
| Automotive motor fuel-dispensing stations b | — | — | — | 1.5 |
| Banks or lobbies | 15 | 7.5 | 0.06 | - |
| Barber | 25 | 7.5 | 0.06 | 0.5 |
| Beauty salons b | 25 | 20 | 0.12 | 0.6 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OCCUPANCY CLASSIFICATION** | **OCCUPANT DENSITY**  **#/1000 FT** | **PEOPLE OUTDOOR AIRFLOW RATE IN**  **BREATHING ZONE, *R* CFM/PERSON** | **AREA OUTDOOR AIRFLOW RATE IN**  **BREATHING ZONE, *R* CFM/FT** | **EXHAUST AIRFLOW** |
| **RATE CFM/FT** |
| Embalming roomb | — | — | — | 2.0 |
| Nail salons b , h | 25 | 20 | 0.12 | 0.6 |
| Pet shops (animal areas)b | 10 | 7.5 | 0.18 | 0.9 |
| Supermarkets | 8 | 7.5 | 0.06 | — |
| **Sports and amusement** |  |  |  |  |
| Bowling alleys (seating areas) | 40 | 10 | 0.12 | — |
| Disco/dance floors | 100 | 20 | 0.06 | — |
| Game arcades | 20 | 7.5 | 0.18 | — |
| Gym, stadium, arena (play area) | 7 | 20 | 0.18 | — |
| Health club/aerobics room | 40 | 20 | 0.06 | — |
| Health club/weight room | 10 | 20 | 0.06 | — |
| Ice arenas without combustion engines | — | — | 0.30 | 0.5 |
| Spectator areas | 150 | 7.5 | 0.06 | — |
| Swimming pools (pool and deck area) | — | — | 0.48 | — |
| **Storage** |  |  |  |  |
| Refrigerated warehouses/freezers (<50°F) | — | 10 | — | 0.75 |
| Repair garages, enclosed parking garagesb, d | — | — | — | 0.75 |
| Warehouses | — | 10 | 0.06 | — |
| **Theaters** |  |  |  |  |
| Auditoriums (see “Education”) | — | — | — | — |
| Lobbies | 150 | 5 | 0.06 | — |
| Stages, studios | 70 | 10 | 0.06 | — |
| Ticket booths | 60 | 5 | 0.06 | — |
| **Transportation** |  |  |  |  |
| Platforms | 100 | 7.5 | 0.06 | — |
| Transportation waiting | 100 | 7.5 | 0.06 | — |
| **Workrooms** |  |  |  |  |
| Bank vaults/safe deposit | 5 | 5 | 0.06 | — |
| Computer (without printing) | 4 | 5 | 0.06 | — |
| Copy, printing rooms | 4 | 5 | 0.06 | 0.5 |
| Darkrooms | — | — | — | 1.0 |
| Manufacturing where hazardous materials are not  used | 7 | 10 | 0.18 | - |
| Manufacturing where hazarous materials are used  (excludes heavy industrial and chemical processes) | 7 | 10 | 0.18 | - |
| Meat processing c | 10 | 15 | — | — |
| Pharmacy (prep. area) | 10 | 5 | 0.18 | — |
| Photo studios | 10 | 5 | 0.12 | — |
| Sorting, packing, light assembly | 7 | 7.5 | 0.12 | - |
| Telephone closets | - | - | 0.00 | - |

For SI: 1 cubic foot per minute = 0.0004719 m3 /s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m 3 /(s • m 2 ), °C = [(°F) – 32]/1.8, 1 square foot = 0.0929 m 2 .

a. Based on *net occupiable floor area.*

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited. For occupancies other than science laboratories, where there is a wheel - type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

i. Outpatient facilities to which the rates apply are freestanding birth centers, urgent care centers, neighborhood clinics and physicians’ offices, Class 1 imaging facilities, outpatient psychiatric facilities, outpatient rehabilitation facilities, and outpatient dental facilities.

j. The requirements of this table provide for acceptable IAQ. The requirements of this table do not address the airborne transmission or airborne viruses, bacteria, and other infectious contagions.

k. These rates are intended only for outpatient dental clinics where the amount of nitrous oxide is limited. They are not intended for dental operatories in institutional buildings where nitrous oxide is piped.

**407.1 General.** Mechanical ventilation for ambulatory care facilities and Group I-2*occupancies* shall be designed and installed in accordance with this code, ASHRAE/ASHE 170 and NFPA 99.

(M11297 / M21-21 AM)

**TABLE 403.3.1.1 MINIMUM VENTILATION RATES**

**Portions of table not shown remain unchanged.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **OCCUPANCY CLASSIFICATION** | **OCCUPANT DENSITY**  **#/1000 FT 2 a** | **PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE,**  ***R p* CFM/PERSON** | **AREA OUTDOOR AIRFLOW RATE IN BREATHING**  **ZONE, *R a* CFM/FT 2 a** | **EXHAUST AIRFLOW RATE CFM/FT 2 a** |
| **Storage** |  |  |  |  |
| Refrigerated warehouses/freezers | — | 10 | — | 0.75 |
| Repair garages, enclosed parking garagesb, d | — | — | — | 0.75 |
| Warehousesi | — | 10 | 0.06 | — |

For SI: 1 cubic foot per minute = 0.0004719 m3 /s, 1 ton = 908 kg, 1 cubic foot per minute per square foot = 0.00508 m 3 /(s • m 2 ), °C = [(°F) – 32]/1.8, 1 square foot = 0.0929 m 2 .

a. Based on *net occupiable floor area.*

b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).

c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.

d. Ventilation systems in enclosed parking garages shall comply with Section 404.

e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.

g. Mechanical exhaust is required and recirculation from such spaces is prohibited. For occupancies other than science laboratories, where there is a wheel - type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).

h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.

i. The occupiable floor area in warehouses shall not include the floor area of self-storage units, floor areas under rack storage, or designated palletized storage floor areas.

(M11298 / M22-21 AS)

**TABLE 403.3.2.3 MINIMUM REQUIRED LOCAL EXHAUST RATES FOR GROUP R-2, R-3 AND R-4 OCCUPANCIES**

|  |  |
| --- | --- |
| **AREA TO BE EXHAUSTED** | **EXHAUST RATE CAPACITY** |
| Kitchens | 100 cfm intermittent or ~~25~~ 50 cfm continuous |
| Bathrooms and toilet rooms | 50 cfm intermittent or ~~20~~ 25 cfm continuous |

For SI: 1 cubic foot per minute = 0.0004719 m3/s.

(M11300 / M24-21 AS)

**CHAPTER 5 EXHAUST SYSTEMS**

**501.3.1 Location of exhaust outlets.** The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings that are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.

2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.

3. For all *environmental air* exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings, except where the exhaust opening is located not less than 1 foot (305 mm) above the gravity air intake opening into buildings for all *occupancies* other than Group U; and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where ~~an approved~~ factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the fan manufacturer's instructions.

No change to item 4 and 5

(M11303 / M28-21 AS)/(M11294 / M16-21 AMPC1)

**501.6 Common ducts.** The discharge from exhaust fans serving separate dwelling or sleeping units shall not be connected to a common duct or shaft, except where the common duct or shaft is maintained at a negative pressure.

(M11304 / M29-21 Part I AS)

Revise as follows:

**504.2 Exhaust penetrations.** Where a clothes dryer exhaust duct penetrates a wall or ceiling membrane, the annular space shall be sealed with noncombustible material, *approved* fire caulking or a noncombustible dryer exhaust duct wall receptacle. Ducts that exhaust clothes dryers shall not penetrate or be located within any fireblocking, ~~draftstopping~~ *draftstops* or any wall, floor/ceiling or other assembly required by the *Florida Building Code, Building* to be fire-resistance rated, unless such duct is constructed of galvanized steel or aluminum of the thickness specified in Section 603.4 and the fire-resistance rating is maintained in accordance with the *Florida Building Code, Building* . Fire dampers, combination fire/smoke dampers and any similar devices that will obstruct the exhaust flow shall be prohibited in clothes dryer exhaust ducts.

(M11228 / FS47-21 Part III AS)

**504.10 Commercial clothes dryers.** The installation of dryer exhaust ducts serving commercial clothes dryers shall comply with the *appliance* manufacturer’s installation instructions. Exhaust fan motors installed in exhaust systems shall be located outside of the airstream. In multiple installations, the fan shall operate continuously or be interlocked to operate when any individual unit is operating. Ducts shall have a minimum *clearance* of 6 inches (152 mm) to combustible materials. Clothes dryer transition ducts used to connect the *appliance* to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm) in length and shall be *listed* and *labeled* in accordance with UL 2158A ~~for the application~~. Transition ducts shall not be concealed within construction.

(M11305 / M31-21 AS)

**506.2 Corrosion protection.** Ducts and exhaust equipment exposed to the outside atmosphere or subject to a corrosive environment shall be protected against corrosion in an *approved* manner.

(M11307 / M34-21 AS)

Revise as follows:

**506.3 ~~Ducts serving Type I hoods~~ Grease duct systems.** ~~Type I exhaust ducts shall be independent of all other exhaust systems except~~ ~~as provided in Section 506.3.5. Commercial kitchen~~ *Grease* duct systems ~~serving Type I hoods~~ shall be designed, constructed and installed in accordance with Sections 506.3.1 through 506.3.13.3.

**Delete without substitution:**

**~~506.3.1 Duct materials~~.** ~~Ducts serving Type I hoods shall be constructed of materials in accordance with Sections 506.3.1.1 and 506.3.1.2~~.

**Revise as follows:**

**506.3.1.1 506.3.1 Grease duct materials.** Grease ducts ~~serving Type I hoods~~ shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) or stainless steel not less than 0.0450 inch (1.14 mm) (No. 18 gage) in thickness.

**Exception:** Factory-built commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978 and installed in accordance with Section 304.1.

**~~506.3.2~~ Joints, seams and penetrations of grease ducts.** Joints, seams and penetrations of grease ducts shall be made with a continuous liquid-tight weld or braze made on the external surface of the grease duct system.

**Exceptions:**

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are *listed* for the application.

2. Internal welding or brazing shall not be prohibited provided that the joint is formed or ground smooth and is provided with ready access for inspection.

3. Factory-built commercial kitchen grease ducts *listed* and *labeled* in accordance with UL 1978 and installed in accordance with Section 304.1.

**506.3.2.1 Grease ~~Duct~~ duct joint types.** Grease duct ~~Duct~~ joints shall be butt joints, welded flange joints with a maximum flange depth of 1/2 inch (12.7 mm) or overlapping duct joints of either the telescoping or bell type. Overlapping joints shall be installed to prevent ledges and obstructions from collecting grease or interfering with gravity drainage to the intended collection point. The difference between the inside cross-sectional dimensions of overlapping sections of duct shall not exceed 1/4 inch (6.4 mm). The length of overlap for overlapping duct joints shall not exceed 2 inches (51 mm).

**506.3.2.2 Grease ~~Duct~~ duct-to-hood joints.** Grease ~~Duct~~ duct-to-hood joints shall be made with continuous internal or external liquid-tight welded or brazed joints. Such joints shall be smooth, ~~accessible~~ available for inspection, and without grease traps.

**Exceptions:** This section shall not apply to:

1. A vertical duct-to-hood collar connection made in the top plane of the hood in accordance with all of the following:

1.1. The ~~hood duct opening~~ the exhaust outlet of the hood shall have a 1-inch-deep (25 mm), full perimeter, welded flange turned down into the hood interior at an angle of 90 degrees (1.57 rad) from the plane of the opening.

1.2. The grease duct shall have a 1-inch-deep (25 mm) flange made by a 1-inch by 1-inch (25 mm by 25 mm) angle iron welded to the full perimeter of the grease duct not less than 1 inch (25 mm) above the bottom end of the duct.

1.3. A gasket rated for use at not less than 1,500ºF (816ºC) is installed between thegrease duct flange and the top of the hood.

1.4. The grease duct-to-hood joint shall be secured by stud bolts not less than1/4 inch (6.4 mm) in diameter welded to the hood with a spacing not greater than 4 inches (102 mm) on center for the full perimeter of the opening. The bolts and nuts shall be secured with lockwashers.

2. *Listed* and *labeled grease* duct-to-hood collar connections installed in accordance with Section 304.1.

**506.3.2.3 Grease ~~Duct~~ duct-to-exhaust fan connections.** Grease ~~Duct~~ duct-to-exhaust fan connections shall be flanged and gasketed at the base of the fan for vertical discharge fans; shall be flanged, gasketed and bolted to the inlet of the fan for side-inlet utility fans; and shall be flanged, gasketed and bolted to the inlet and outlet of the fan for in-line fans. Gasket and sealing materials shall be rated for continuous duty at a temperature of not less than 1,500ºF (816ºC).

**506.3.2.4 Vibration isolation.** A vibration isolation connector for connecting a grease duct to a fan shall consist of noncombustible packing in a metal sleeve joint of *approved* design or shall be a coated-fabric flexible grease duct connector *listed* and *labeled* for the application. Vibration isolation connectors shall be installed only at the connection of a grease duct to a fan inlet or outlet.

**506.3.2.5 Grease duct test.** A field test shall be performed ~~Prior~~ prior to the use or concealment of any portion of a grease duct system~~, a leakage test shall be performed~~. Grease ducts ~~Ducts~~ shall be considered to be concealed where installed in shafts or covered by coatings or wraps that prevent the ~~ductwork~~ grease ducts from being visually inspected on all sides. The permit holder shall be responsible to provide the necessary *equipment* and perform the grease duct leakage test. ~~A light test shall be performed to determine that all welded and brazed joints are liquid tight. A light test shall be performed by passing a lamp having a power rating of not less than 100 watts through the entire section odf uctwork grease ducts to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls.~~ A test shall be performed for the entire grease duct system, including the hood-to-duct connection. The grease duct ~~work~~ system shall be permitted to be tested in sections, provided that every joint is tested. For *listed* factory-built grease ducts, this test shall be limited to duct joints assembled in the field and shall exclude factory welds. The test shall be performed in accordance with either Section 506.3.2.5.1 or Section 506.3.2.5.2.

Add new text as follows:

**506.3.2.5.3.1 Light test.** A duct test shall be performed by passing a lamp having not less than 1600 lumens, through the entire section of ductwork to be tested. The lamp shall be open so as to emit light equally in all directions perpendicular to the duct walls. A successful test shall be where the light from the lamp is not visible at any point on the exterior of the duct.

**506.3.2.5.2 Water spray test.** A duct test shall be performed by simulating a cleaning operation, of the interior of the duct. A water pump, capable of a flowing outlet pressure of not less than 1200 psi ( 8,274 kPa) shall be used, along with any necessary hoses and spray nozzles, to apply high pressure water to the inside surfaces of the duct. A successful test shall be where there is no evidence of cleaning water at any point on the exterior of the duct.

**506.3.3 Grease duct supports.** Grease duct bracing and supports shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *Florida Building Code, Building* . Bolts, screws, rivets and other mechanical fasteners shall not penetrate grease duct walls.

**506.3.4 Air velocity.** Grease duct systems ~~serving a Type I hood~~ shall be designed and installed to provide an air velocity within the grease duct system of not less than 500 feet per minute (2.5 m/s).

**Exception:** The velocity limitations shall not apply within grease duct transitions utilized to connect grease ducts to differently sized or shaped openings in hoods and fans, provided that such transitions do not exceed 3 feet (914 mm) in length and are designed to prevent the trapping of grease.

**506.3.5 Separation of grease duct system.** A separate grease duct system shall be provided for each Type I hood. A separate grease duct system is not required where all of the following conditions are met:

1. All interconnected hoods are located within the same story.

2. All interconnected hoods are located within the same room or in adjoining rooms.

3. Interconnecting grease ducts do not penetrate assemblies required to be fire-resistance rated.

4. The grease duct system does not serve solid-fuel-fired *appliances*.

**506.3.7 Prevention of grease accumulation in grease ducts.** ~~Duct~~ Grease duct systems serving a Type I hood shall be constructed and installed so that grease cannot collect in any portion thereof, and the system shall slope not less than one-fourth unit vertical in 12 units horizontal (2-percent slope) toward the hood or toward a grease reservoir designed and installed in accordance with Section 506.3.7.1. Where horizontal grease ducts exceed 75 feet (22 860 mm) in length, the slope shall be not less than one unit vertical in 12 units horizontal (8.3-percent slope).

**Exception:** Factory-built grease ducts shall be installed at a slope that is in accordance with the listing and manufacturer's installation instructions.

**506.3.7.1 Grease duct reservoirs.** Grease duct reservoirs shall:

1. Be constructed as required for the grease duct they serve.

2. Be located on the bottom of the horizontal grease duct or the bottommost section of the grease duct riser.

3. Extend across the full width of the grease duct and have a length of not less than 12 inches (305 mm).

4. Have a depth of not less than 1 inch (25 mm).

5. Have a bottom that slopes to a drain.

6. Be provided with a cleanout opening constructed in accordance with Section 506.3.8 and installed to provide direct access to the reservoir. The cleanout opening shall be located on a side or on top of the grease duct so as to permit cleaning of the reservoir.

7. Be installed in accordance with the manufacturer’s instructions where manufactured devices are utilized.

**506.3.8 Grease duct cleanouts and openings.** Grease duct cleanouts and openings shall comply with all of the following:

1. Grease ducts shall not have openings except where required for the operation and maintenance of the system.

2. Sections of grease ducts that are inaccessible from the hood or discharge openings shall be provided with cleanout openings spaced not more than 20 feet (6096 mm) apart and not more than 10 feet (3048 mm) from changes in direction greater than 45 degrees (0.79 rad).

3. Cleanouts and openings shall be equipped with tight-fitting doors constructed of steel having a thickness not less than that required for the grease duct.

4. Cleanout doors shall be installed liquid tight.

5. Door assemblies including any frames and gaskets shall be approved for the application and shall not have fasteners that penetrate the grease duct.

6. Gasket and sealing materials shall be rated for not less than 1,500ºF (816ºC).

7. Listed door assemblies shall be installed in accordance with the manufacturer’s instructions.

**506.3.8.1 Personnel entry.** Where a grease duct ~~ductwork~~ is large enough to allow entry of personnel, not less than one*approved* or *listed* opening having dimensions not less than 22 inches by 20 inches (559 mm by 508 mm) shall be provided in the horizontal sections, and in the top of vertical risers. Where such entry is provided, the grease duct and its supports shall be capable of supporting the additional load, and the cleanouts specified in Section 506.3.8 are not required.

**506.3.8.2 Cleanouts serving in-line fans.** A cleanout shall be provided for both the inlet side and outlet side of an in-line fan except where a grease duct does not connect to the fan. Such cleanouts shall be located within 3 feet (914 mm) of the fan duct connections.

**506.3.9 Grease duct horizontal cleanouts.** Cleanouts serving horizontal sections of grease ducts shall:

1. Be spaced not more than 20 feet (6096 mm) apart.

2. Be located not more than 10 feet (3048 mm) from changes in direction that are greater than 45 degrees (0.79 rad).

3. Be located on the bottom only where other locations are not available and shall be provided with internal damming of the opening such that grease will flow past the opening without pooling. Bottom cleanouts and openings shall be approved for the application and installed liquid tight.

4. Not be closer than 1 inch (25 mm) from the edges of the grease duct.

5. Have opening dimensions of not less than 12 inches by 12 inches (305 mm by 305 mm). Where such dimensions preclude installation, the opening shall be not less than 12 inches (305 mm) on one side and shall be large enough to provide access for cleaning and maintenance.

6. Be located at grease reservoirs.

7. Be located within 3 feet (914 mm) of horizontal discharge fans.

**506.3.10 Underground grease duct installation.** Underground grease duct installations shall comply with all of the following:

1. Underground grease ducts shall be constructed of steel having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage) and shall be coated to provide protection from corrosion or shall be constructed of stainless steel having a minimum thickness of 0.0450 inch (1.140 mm) (No. 18 gage).

2. The underground grease duct system shall be tested and approved in accordance with Section 506.3.2.5 prior to coating or placement in the ground.

3. The underground grease duct system shall be completely encased in concrete with a minimum thickness of 4 inches (102 mm).

4. Ducts shall slope toward grease reservoirs.

5. A grease reservoir with a cleanout to allow cleaning of the reservoir shall be provided at the base of each vertical grease duct riser.

6. Cleanouts shall be provided with access to permit cleaning and inspection of the grease duct in accordance with Section 506.3.

7. Cleanouts in horizontal grease ducts shall be installed on the topside of the grease duct.

8. Cleanout locations shall be legibly identified at the point of access from the interior space.

**506.3.11 Grease duct enclosures.** A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed space shall be enclosed from the point of penetration to the outlet terminal. In-line exhaust fans not located outdoors shall be enclosed as required for grease ducts. A grease duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *Florida Building Code, Building*. The grease duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Grease duct ~~Duct~~ enclosures shall be a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with Section 506.3.11.2 or a factory-built grease duct enclosure assembly in accordance with Section 506.3.11.3. Grease duct ~~Duct~~ enclosures shall have a fire-resistance rating of not less than that of the assembly penetrated and not less than 1 hour. Fire dampers and smoke dampers shall not be installed in grease ducts.

**Exception:** A grease duct enclosure shall not be required for a grease duct that penetrates only a non fire-resistance-rated roof/ceiling assembly.

**506.3.11.1 Shaft enclosure.** Grease ducts constructed in accordance with Section 506.3.1 shall be permitted to be enclosed in accordance with the *Florida Building Code, Building* requirements for shaft construction. Such grease duct systems and exhaust *equipment* shall have a *clearance* to combustible construction of not less than 18 inches (457 mm), and shall have a *clearance* to noncombustible construction and gypsum wallboard attached to noncombustible structures of not less than 6 inches (152 mm). Shaft ~~Duct~~ enclosures shall be sealed around the grease duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings.

**506.3.11.2 Field-applied grease duct enclosure.** Grease ducts constructed in accordance with Section 506.3.1 shall be enclosed by a *listed* and *labeled* field-applied grease duct enclosure material, systems, product, or method of construction specifically evaluated for such purpose in accordance with ASTM E2336. The surface of the grease duct shall be continuously covered on all sides from the point at which the grease duct originates to the outlet terminal. Grease duct ~~Duct~~ penetrations shall be protected with a through-penetration firestop system tested and *listed* in accordance with ASTM E814 or UL 1479 and having a “F” and “T” rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions. Partial application of a field-applied grease duct enclosure shall not be installed for the sole purpose of reducing

*clearances* to combustibles at isolated sections of grease duct. Exposed duct-wrap systems shall be protected where subject to physical damage.

**506.3.11.3 Factory-built grease duct enclosure assemblies.** Factory-built grease ducts incorporating integral enclosure materials shall be *listed* and *labeled* for use as grease duct enclosure assemblies specifically evaluated for such purpose in accordance with UL 2221. Grease duct ~~Duct~~ penetrations shall be protected with a through-penetration firestop system tested and *listed* in accordance with ASTM E814 or UL 1479 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated. The grease duct enclosure assembly and firestop system shall be installed in accordance with the listing and the manufacturer’s instructions.

**506.3.12 Grease duct fire-resistive access opening.** Where cleanout openings are located in grease ducts within a fire-resistance-rated enclosure, access openings shall be provided in the enclosure at each cleanout point. Access openings shall be equipped with tight-fitting sliding or hinged doors that are equal in fire-resistive protection to that of the shaft or enclosure. An *approved* sign shall be placed on access opening panels with wording as follows: “ACCESS PANEL. DO NOT OBSTRUCT.”

**506.3.13 Exhaust outlets ~~serving Type I hoods~~.** Exhaust outlets for grease ducts ~~serving Type I hoods~~ shall conform to the requirements of Sections 506.3.13.1 through 506.3.13.3.

**506.5.1 Exhaust fans.** Exhaust fan housings serving a Type I hood shall be constructed as required for grease ducts in accordance with Section 506.3.1.1.

**Exception:** Fans *listed* and *labeled* in accordance with ~~UL 762~~. UL 705

**506.5.1.2 In-line fan location.** Where enclosed grease duct systems are connected to in-line fans not located outdoors, the fan shall be located in a room or space having the same fire-resistance rating as the grease duct enclosure. Access shall be provided for servicing and cleaning of fan components. Such rooms or spaces shall be ventilated in accordance with the fan manufacturer’s installation instructions.

**506.5.2 Pollution-control units.** The installation of pollution-control units shall be in accordance with all of the following:

1. Pollution-control units shall be *listed* and *labeled* in accordance with UL 8782.

2. Fans serving pollution-control units shall be *listed* and *labeled* in accordance with ~~UL 762~~.UL 705.

3. Bracing and supports for pollution-control units shall be of noncombustible material securely attached to the structure and designed to carry gravity and seismic loads within the stress limitations of the *Florida Building Code, Building*.

4. Pollution-control units located indoors shall be *listed* and *labeled* for such use. Where enclosed grease duct systems, as required by Section 506.3.11, are connected to a pollution control unit, such unit shall be *listed* and *labeled*, in accordance with UL 2221 or ASTM E2336, for location in an enclosure having the same fire-resistance rating as the duct enclosure. Access shall be provided for servicing and cleaning of the unit. The space or enclosure shall be ventilated in accordance with the manufacturer’s installation instructions.

5. *Clearances* shall be maintained between the pollution-control unit and combustible material in accordance with the listing.

6. Roof-mounted pollution-control units shall be listed for outdoor 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 utilized 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. Grease duct ~~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). Grease ducts ~~Ducts~~ shall transition to the full size of the unit’s inlet and outlet openings.

14. Extra-heavy-duty *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.

**506.5.4 Exhaust fan mounting.** Upblast fans serving Type I hoods and installed in a vertical or horizontal position shall be hinged, supplied with a flexible weatherproof electrical cable to permit inspection and cleaning and shall be equipped with a means of restraint to limit the swing of the fan on its hinge. The grease duct system ~~ductwork~~ shall extend not less than 18 inches (457 mm) above the roof surface.

**507.2.4 Type I supports.** Type I hoods shall be secured in place by noncombustible supports. Type I hood supports shall be adequate for the applied load of the hood, the unsupported grease duct system ~~ductwork~~, the effluent loading and the possible weight of personnel working in or on the hood.

**~~506.3.1.2~~ 508.1.2 Makeup air ducts.** *Makeup air* ducts connecting to or within 18 inches (457 mm) of a Type I hood shall be constructed and installed in accordance with Sections 603.1, 603.3, 603.4, 603.9, 603.10 and 603.12. Duct insulation installed within 18 inches (457 mm) of a Type I hood shall be noncombustible or shall be *listed* for the application.

(M11308 / M35-21 AS)/ (M11229 / G1-21 Part V AS)/ (M11310 / M38-21 AS)/ (M11311 / M39-21 AS)

**507.1 General.** Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I hood shall be installed at or above appliances in accordance with Section 507.2. ~~or~~ A Type II hood shall be installed at or above *appliances* in accordance with ~~Sections 507.2 and~~ Section 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. Where a Type I hood is installed, the installation of the entire system, including the hood, grease ducts, exhaust *equipment* and *makeup air* system shall comply with the requirements of Sections 506, 507,and 508 ~~and 509~~.

**Exceptions:**

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.1.6 507.2.3, 507.2.5, 507.2.8, 507.2.10 507.3.1, and

507.3.3~~, 507.4 and 507.5~~.

2. Factory-built commercial cooking recirculating systems that are *listed* and *labeled* in accordance with UL 710B, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.1.6 507.2.3, 507.2.5, 507.2.8,

507.2.10 507.3.1, and 507.3.3~~, 507.4 and 507.5~~. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual *appliance* shall be considered as occupying not less than 100 square feet (9.3 m2).

3. Where cooking *appliances* are equipped with integral down-draft exhaust systems and such *appliances* and exhaust systems are

*listed* and *labeled* for the application in accordance with NFPA 96, a hood shall not be required at or above them.

4. Smoker ovens with integral exhaust systems, provided that the *appliance* is installed in accordance with the manufacturer's installation instructions, is listed and tested for the application, and complies with Chapter 5.

**507.1.1 Operation.** Commercial kitchen exhaust hood systems shall operate during the cooking operation. The hood exhaust rate shall comply with either the listing of the hood Section 507.2.10, or ~~shall comply with~~ Section 507.3.4 ~~507.5~~. The exhaust fan serving a Type I hood shall have automatic controls that will activate the fan when any *appliance* that requires such Type I hood is turned on, or a means of interlock shall be provided that will prevent operation of such *appliances* when the exhaust fan is not turned on. Where one or more temperature or radiant energy sensors are used to activate a Type I hood exhaust fan, the fan shall activate not more than 15 minutes after the first *appliance* served by that hood has been turned on. A method of interlock between an exhaust hood system and *appliances* equipped with standing pilot burners shall not cause the pilot burners to be extinguished. A method of interlock between an exhaust hood system and cooking *appliances* shall not involve or depend on any component of a fire-extinguishing system. The net exhaust volumes for hoods shall be permitted to be reduced during part-load cooking conditions, where engineered or *listed* multispeed or variable speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required by this section. Reduced volumes shall not be below that required to maintain capture and removal of effluents from the idle cooking *appliances* that are operating in a standby mode.

**507.1.2 Domestic cooking appliances used for commercial purposes.** Domestic cooking *appliances* utilized for commercial purposes shall be provided with either Type I or Type II hoods as required for the type of *appliances* and processes in accordance with Sections

507.2 and 507.3. Domestic cooking *appliances* utilized for domestic cooking shall comply with Section 505.

**~~507.4~~ 507.1.6 Hood size and location.** Hoods shall comply with the overhang, setback and height requirements in accordance with Sections ~~507.4.1~~ 507.6.1 and ~~507.4.2~~ 507.1.6.2, based on the type of hood.

**~~507.4.1~~ 507.1.6.1 Canopy size and location.** The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the *appliance* on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

**Exception:** The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the*appliance* side by a noncombustible wall or panel.

**~~507.4.2~~ 507.1.6.2 Noncanopy size and location.** Noncanopy-type hoods shall be located not greater than 3 feet (914 mm) above the cooking surface. The edge of the hood shall be set back not greater than 1 foot (305 mm) from the edge of the cooking surface.

**~~507.6~~ 507.1.7 Performance test.** A performance test shall be conducted upon completion and before final approval of the installation of a ventilation system serving *commercial cooking appliances*. The test shall verify the rate of exhaust airflow required by Section ~~507.5~~

507.2.10 or Section 507.3.4, makeup airflow required by Section 508 and proper operation as specified in this chapter. The permit holder shall furnish the necessary test *equipment* and devices required to perform the tests.

**~~507.6.1~~ 507.1.7.1 Capture and containment test.** The permit holder shall verify capture and containment performance of the exhaust system. This field test shall be conducted with all *appliances* under the hood at operating temperatures, with all sources of outdoor air providing *makeup air* for the hood operating and with all sources of recirculated air providing conditioning for the space in which the hood is located operating. Capture and containment shall be verified visually by observing smoke or steam produced by actual or simulated cooking, such as that provided by smoke generators. .

**~~507.5.1~~ 507.2.2.10.1 Extra-heavy-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for

*extra-heavy-duty cooking appliances* shall be determined as follows:

|  |  |
| --- | --- |
| **Type of Hood** | **CFM per linear foot of hood** |
| Backshelf/pass-over | Not allowed |
| Double island canopy (per side) | 550 |
| Eyebrow | Not allowed |
| Single island canopy | 700 |
| Wall-mounted canopy | 550 |

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

**~~507.5.2~~ 507.2.2.10.2 Heavy-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for

*heavy-duty cooking appliances* shall be determined as follows:

|  |  |
| --- | --- |
| **Type of Hood** | **CFM per linear foot of hood** |
| Backshelf/pass-over | 400 |
| Double island canopy (per side) | 400 |
| Eyebrow | Not allowed |
| Single island canopy | 600 |
| Wall-mounted canopy | 400 |

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

**~~507.5.3~~ 507.2.2.10.3 Medium-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for

*medium-duty cooking appliances* shall be determined as follows:

|  |  |
| --- | --- |
| **Type of Hood** | **CFM per linear foot of hood** |

|  |  |
| --- | --- |
| Backshelf/pass-over | 300 |
| Double island canopy (per side) | 300 |
| Eyebrow | 250 |
| Single island canopy | 500 |
| Wall-mounted canopy | 300 |

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

**~~507.5~~ 507.2.10 Capacity of Tye I hoods.** Commercial food service hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections ~~507.5.1~~ 507.2.10.1 through ~~507.5.5~~ 507.2.10.4. The net quantity of *exhaust air* shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood. Where any combination of *heavy-duty, medium-duty* and *light-duty cooking appliances* are utilized under a single hood, the exhaust rate required by this section for the heaviest duty *appliance* covered by the hood shall be used for the entire hood.

**~~509.1~~ 507.2.11 ~~Where required~~ Fire suppression systems.** *~~Cooking appliances~~* ~~required by Section 507.2 to have~~ a Type I hood shall be provided with an *approved* automatic fire suppression system complying with Section 904.12 of the *Florida Building Code, Building* and the *Florida Fire Prevention Code* .

**507.3 Type II hoods.** Type II hoods shall be installed above *light-duty cooking appliances* dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process, except where the heat and moisture loads from such *appliances* are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. Spaces containing cooking *appliances* that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 m3/(s • m2). For the purpose of determining the floor area required to be exhausted, each individual *appliance* that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 m3/(s • m2)].

**Add new text as follows:**

**507.3.4 Capacity of Type II hoods.** Type II hoods shall exhaust a minimum net quantity of air determined in accordance with this section and Sections 507.3.4.1 through 507.3.4.2. The net quantity of exhaust air shall be calculated by subtracting any airflow supplied directly to a hood cavity from the total exhaust flow rate of a hood.

**Revise as follows:**

**~~507.5.4~~ 507.3.4.1 Light-duty cooking appliances.** The minimum net airflow for hoods~~, as determined by Section 507.1~~, used for *light-duty*

cooking *appliances* and food service preparation shall be determined as follows:

|  |  |
| --- | --- |
| **Type of Hood** | **CFM per linear foot of hood** |
| Backshelf/pass-over | 250 |
| Double island canopy (per side) | 250 |
| Eyebrow | 250 |
| Single island canopy | 400 |
| Wall-mounted canopy | 200 |

For SI: 1 cfm per linear foot = 1.55 L/s per linear meter.

**~~507.5.5~~ 507.3.4.2 Dishwashing appliances.** The minimum net airflow for Type II hoods used for dishwashing *appliances* shall be 100 cfm per linear foot (155 L/s per linear meter) of hood length.

**Exception:** Dishwashing *appliances* and *equipment* installed in accordance with Section 507.3.

(M11312 / M40-21 AS)/ (M11308 / M35-21 AS)

**507.1 General.** Commercial kitchen exhaust hoods shall comply with the requirements of this section. Hoods shall be Type I or II and shall be designed to capture and confine cooking vapors and residues. A Type I or Type II hood shall be installed at or above *appliances* in accordance with Sections 507.2 and 507.3. Where any cooking *appliance* under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed. ~~Where a Type I hood is installed, the installation~~ ~~of the entire system, including the hood, ducts, exhaust~~ *~~equipment~~* ~~and~~ *~~makeup air~~* ~~system shall comply with the requirements of Sections~~ ~~506, 507, 508 and 509.~~

**Exceptions:**

1. Factory-built commercial exhaust hoods that are *listed* and *labeled* in accordance with UL 710, and installed in accordance with Section 304.1, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5, 507.2.8, 507.3.1, 507.3.3, 507.4 and

507.5.

2. A hood shall not be required at or above any of the following:

~~2~~2.1. Factory-built commercial cooking recirculating systems ~~that are~~ listed and labeled in accordance with UL 710B, and installed in accordance with Section 304.1~~, shall not be required to comply with Sections 507.1.5, 507.2.3, 507.2.5,~~ ~~507.2.8, 507.3.1, 507.3.3, 507.4 and 507.5~~. Spaces in which such systems are located shall be considered to be kitchens and shall be ventilated in accordance with Table 403.3.1.1. For the purpose of determining the floor area required to be ventilated, each individual appliance shall be considered as occupying not less than 100 square feet (9.3 m2).

~~3~~ 2.2. ~~Where~~ cooking appliances are equipped with integral down-draft exhaust systems and such appliances and exhaust systems are listed and labeled for the application in accordance with NFPA 96~~, a hood shall not be required at or above~~ ~~them~~.

~~4~~ 2.3. Smoker ovens with integral exhaust systems~~, provided~~ that ~~the appliance is installed in accordance with the~~ ~~manufacturer's installation instructions, is~~ are listed and tested for the application~~, and complies with Chapter 5~~.

3. Ovens listed and labeled for use with wood fuel in accordance with UL 2162 and vented in accordance with the manufacturer's instructions.

4. An electric cooking appliance listed and labeled in accordance with UL 197 for reduced grease emissions.

5. Commercial electric dishwashers incorporating a self-contained condensing system listed and labeled in accordance with UL 921.

6. Where the heat and moisture loads from dishwashers and appliances that produce heat or moisture and do not produce grease or smoke as a result of the cooking process are incorporated into the HVAC system design or into the design of a separate removal system. Spaces containing such cooking appliances that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356 m3/(s • m2). For the purpose of determining the floor area required to be exhausted, each individual appliance that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet (9.3 m2). Such additional square footage shall be provided with exhaust at a rate of 0.70 cfm per square foot [0.00356 m3/(s • m2)].

**507.2 Type I hoods.** Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances*.

**~~Exception:~~** ~~A Type I hood shall not be required for an electric cooking~~ *~~appliance~~* ~~where an approved testing agency provides~~ ~~documentation that the~~ *~~appliance~~* ~~effluent contains 5 mg/m~~3 ~~or less of grease when tested at an exhaust flow rate of 500 cfm (0.236~~ ~~m~~3~~/s) in accordance with UL 710B~~.

**507.3 Type II hoods.** Type II hoods shall be installed above dishwashers and *appliances* that produce heat or moisture and do not produce grease or smoke as a result of the cooking process~~, except where the heat and moisture loads from such~~ *~~appliances~~* ~~are incorporated into~~ ~~the HVAC system design or into the design of a separate removal system~~. Type II hoods shall be installed above all *appliances* that produce products of combustion and do not produce grease or smoke as a result of the cooking process. ~~Spaces containing cooking~~ *~~appliances~~* ~~that do not require Type II hoods shall be provided with exhaust at a rate of 0.70 cfm per square foot (0.00356~~ m3~~/(s • m~~2~~). For~~ ~~the purpose of determining the floor area required to be exhausted, each individual~~ *~~appliance~~* ~~that is not required to be installed under a~~ ~~Type II hood shall be considered as occupying not less than 100 square feet (9.3 m~~2~~). Such additional square footage shall be provided~~ ~~with exhaust at a rate of 0.70 cfm per square foot [0.00356 m~~3~~/(s • m~~2~~)].~~ A Type I hood shall be permitted to be installed for a required Type II hood provided that the Type I hood installation complies with all of the requirements for a Type I hood installation. Where such a Type I hood serves only dishwashers and appliances that require a Type II hood, the Type I hood shall not be required to have fire suppression or grease filters.

**507.5.5 Dishwashing appliances.** The minimum net airflow for Type II hoods used for dishwashing *appliances* shall be 100 cfm per linear

foot (155 L/s per linear meter) of hood length.

**~~Exception:~~** ~~Dishwashing~~ *~~appliances~~* ~~and~~ *~~equipment~~* ~~installed in accordance with Section 507.3~~.

(M11313 / M41-21 AS)/(M11314 / M42-21 AS)/(M11315 / M43-21 AS)/(M11316 / M44-21 AS)/(M11317 / M45-21 AS)/(M11318 / M46-21 AS)

**~~507.1.3 Fuel-burning appliances~~.** ~~Where vented fuel-burning~~ *~~appliances~~* ~~are located in the same room or space as the hood, provisions~~ ~~shall be made to prevent the hood system from interfering with normal operation of the~~ *~~appliance~~* ~~vents.~~

**507.1.3 Fuel-burning appliances.** Appliances equipped with draft hoods or atmospheric burners shall not be located in the same room or space containing a Type I or Type II hood except where the appliance is located in a sealed enclosure equipped with a self-closing device with combustion air obtained from the outdoors or from other spaces in the building in accordance with Chapter 7 or the Florida Building Code, Fuel Gas.

(M11319 / M47-21 AS)

**~~508.1.1 Makeup air temperature~~.** ~~The temperature differential between~~ *~~makeup air~~* ~~and the air in the conditioned space shall not exceed~~ ~~10ºF (6ºC) except where the added heating and cooling loads of the~~ *~~makeup air~~* ~~do not exceed the capacity of the HVAC system~~.

**508.1.1 Makeup air temperature.** HVAC systems that serve the kitchen space shall have the additional capacity necessary for the latent and sensible loads that are introduced by the makeup air supplied to the kitchen space, or the makeup air shall be conditioned by dedicated systems such that the difference in temperature between the makeup air supplied to the kitchen space and the design setpoint temperature in the kitchen space is not greater than 10 degrees F (6 degrees C).

**Exception:** Makeup air supplied to a compensating hood shall not not be required to be conditioned.

(M11321 / M49-21 AS)

**CHAPTER 6 DUCT SYSTEMS**

**~~602.1~~ General.** Supply, return, exhaust, relief and ventilation air *plenums* shall be in accordance with this section. ~~limited to uninhabited~~ ~~crawl spaces, areas above a ceiling or below the floor, attic spaces, mechanical~~ *~~equipment~~* ~~rooms and the framing cavities addressed in~~ ~~Section 602.3.~~ *~~Plenums~~* ~~shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the~~ ~~air-handling~~ *~~equipment~~*~~.~~ Fuel-fired *appliances* shall not be installed within a *plenum*.

**Add new text as follows:**

**602.1.1 Locations limited.** Plenums shall be limited to uninhabited crawl spaces, above a ceiling or below the floor, attic spaces, mechanical equipment rooms and the framing cavities addressed in Section 602.2.

**602.1.2 Limited to a fire area. .** Plenums shall be limited to one fire area. Air systems shall be ducted from the boundary of the fire area served directly to the air-handling equipment.

**602.1.3 Fuel fired appliances. .** Fuel-fired appliances shall not be installed within a plenum.

**Revise as follows:**

**602.2 Construction of plenums..** *Plenum* enclosure construction materials that are exposed to the airflow shall comply with the requirements of Section 703.3 of the Florida Building Code, Building or such materials shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.The use of gypsum boards to form *plenums* shall be limited to systems where the air temperatures do not exceed 125ºF (52ºC) and the building and mechanical system design conditions are such that the gypsum board surface temperature will be maintained above the airstream dew-point temperature. Supply air *plenums* formed by gypsum boards shall not be incorporated in air-handling systems utilizing *direct evaporative cooling* systems.

**~~602.3~~602.2.1 Stud cavity and joist space plenums.** Stud wall cavities and the spaces between solid floor joists to be utilized as air

*plenums* shall comply with the following conditions:

1. Such cavities or spaces shall not be utilized as a*plenum* for supply air.

2. Such cavities or spaces shall not be part of a required fire-resistance-rated assembly.

3. Stud wall cavities shall not convey air from more than one floor level.

4. Stud wall cavities and joist space *plenums* shall comply with the floor penetration protection requirements of the Florida Building Code, Building.

5. Stud wall cavities and joist space *plenums* shall be isolated from adjacent concealed spaces by *approved* fireblocking as required in the *Florida Building Code, Building*.

6. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air *plenums*.

**Delete without substitution:**

**~~602.2.1.4 Electrical equipment in plenums~~.** ~~Electrical~~ *~~equipment~~* ~~exposed within a~~ *~~plenum~~* ~~shall comply with Sections 602.2.1.4.1 and~~ ~~602.2.1.4.2.~~

**~~602.2.1.4.1 Equipment in metallic enclosures~~.** ~~Electrical~~ *~~equipment~~* ~~with metallic enclosures exposed within a~~ *~~plenum~~* ~~shall be permitted~~.

**~~602.2.1.4.2 Equipment in combustible enclosures~~.** ~~Electrical~~ *~~equipment~~* ~~with combustible enclosures exposed within a~~ *~~plenum~~* ~~shall be~~

*l~~isted~~* ~~and~~ *~~labeled~~* ~~for such use in accordance with UL 2043~~.

**Revise as follows:**

**~~602.2.1~~ 602.3 Materials within plenums.** ~~Except as required by Sections 602.2.1.1 through 602.2.1.8, m~~Materials within *plenums* shall be noncombustible or shall be in compliance with the applicable requirements in Sections 602.3.1 through 602.3.10. *l~~isted~~* ~~and~~ *~~labeled~~* ~~as~~ ~~having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM~~ ~~E84 or UL 723.~~

**Exception~~s~~:** This section shall not apply to the following:

1. ~~Rigid and flexible ducts and connectors shall conform to Section 603~~.Materials exposed within plenums in one- and two-family dwellings.

2. ~~Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.~~ Combustible materials fully enclosed within one of the following:

3. ~~This section shall not apply to materials exposed within~~ *~~plenums~~* ~~in one- and two-family dwellings~~.

4. ~~This section shall not apply to smoke detectors~~.

5. ~~Combustible materials fully enclosed within one of the following~~:

5.1. 2.1 Continuous noncombustible raceways or enclosures.

5.2. 2.2 Approved gypsum board assemblies.

5.3. 2.3 Materials *listed* and *labeled* for installation within a *plenum* and listed for the application.

6. 3. Materials in Group H, Division 5 fabrication areas and the areas above and below the fabrication area that share a common air recirculation path with the fabrication area.

**~~602.2.1.1~~ 602.3.3 Wiring.** Combustible electrical wires and cables and optical fiber cables exposed within a *plenum* shall be *listed* and *labeled* 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) when tested in accordance with NFPA 262, or shall be installed in metal raceways or metal sheathed cable. Combustible optical fiber and communication raceways exposed within a *plenum* shall be *listed* and *labeled* as having a peak optical density not greater than 0.5, an average optical density not greater than 0.15, and a flame spread distance not greater than 5 feet (1524 mm) when tested in accordance with UL 2024. Only plenum-rated wires and cables shall be installed in plenum-rated raceways.

**~~602.2.1.2~~ 602.3.4 Fire sprinkler piping.** Plastic fire sprinkler piping exposed within a *plenum* shall be used only in wet pipe systems and shall be *listed* and *labeled* 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) when tested in accordance with UL 1887.

**~~602.2.1.3~~ 602.3.5 Pneumatic tubing.** Combustible pneumatic tubing exposed within a *plenum* shall be *listed* and *labeled* 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) when tested in accordance with UL 1820.

**~~602.2.1.5~~ 602.3.6 Discrete electrical, plumbing and mechanical products in plenums.**Where discrete electrical, plumbing and mechanical products and appurtenances are located in a *plenum* and have exposed combustible material, they shall be*listed* and *labeled* for such use in accordance with UL 2043.

Exception: Electrical equipment with metallic enclosures exposed within a plenum.

**~~602.2.1.6~~ 602.3.7 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. As an alternative to testing to NFPA 286, the foam plastic shall be approved based on tests conducted in accordance with Section 2603.9 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 smoke-developed 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 smoke-developed 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 smoke-developed 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~~ 602.3.8 Plastic plumbing piping and tubing.** Plastic piping and tubing used in plumbing systems shall be *listed* and *labeled* as having a flame spread index not greater than 25 and a smoke-developed index not greater 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~~ 602.3.9 Pipe and duct insulation within plenums.** Pipe and duct insulation contained within *plenums*, including insulation adhesives, shall have a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Pipe and duct insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Pipe and duct insulation shall be *listed* and *labeled*. Pipe and duct insulation shall not be used to reduce the maximum flame spread and smoke-developed indices except where the pipe or duct and its related insulation, coatings, and adhesives are tested as a composite assembly in accordance with Section ~~602.2.1.7~~ 602.3.9.

**Add new text as follows:**

**602.3.1 Ducts, connectors, duct coverings, linings, and tape. .**

Rigid and flexible ducts and connectors shall conform to Section 603. Duct coverings, linings, tape and connectors shall conform to Sections 603 and 604.

602.3.2 Smoke detectors. .

Smoke detectors shall be listed and labeled.

**602.3.10 Other combustible materials.** Other combustible materials not covered by Section 602.3 shall be listed and labeled as having a flame spread index of not more than 25 and a smoke-developed index of not more than 50 when tested in accordance with ASTM E84 or UL 723.

(M11324 / M55-21 AM)

**604.3 Coverings and linings.** Duct coverings and linings, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than ~~50~~4 50, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings and linings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings and linings shall be *listed* and *labeled*.

**~~Exception~~ Exceptions:**

1. Polyurethane foam insulation that is spray applied to the exterior of ducts in attics and crawl spaces shall be subject to all of the following requirements:

1. The foam plastic insulation shall have a flame spread index not greater than 25 and a smoke-developed index not greater than 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231.

2. The foam plastic insulation shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C).

3. The foam plastic insulation complies with the requirements of Section 2603 of the Florida Building Code, Building.

4. The foam plastic insulation is protected against ignition in accordance with the requirements of Section 2603.4.1.6 of the Florida Building Code, Building.

2. Duct coverings added to the outside of ducts and not contained in plenums, including adhesives where used, shall have a flame spread index not more than 25 and a smoke-developed index not more than 450, when tested in accordance with ASTM E84 or UL 723, using the specimen preparation and mounting procedures of ASTM E2231. Duct coverings shall not flame, glow, smolder or smoke when tested in accordance with ASTM C411 at the temperature to which they are exposed in service. The test temperature shall not fall below 250°F (121°C). Coverings shall be *listed* and *labeled*.

(M11325 / M60-21 AM)

Revise Section 607.5.2 to read as follows:

**607.5.2 Fire barriers.**

**P**

Ducts and air transfer openings that penetrate fire barriers shall be protected with *listed* fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for interior exit stairways and ramps and exit passageways except as permitted by [Sections 1023.5](https://codes.iccsafe.org/lookup/IBC2021P1_Ch10_Sec1023.5/2220) and [1024.6](https://codes.iccsafe.org/lookup/IBC2021P1_Ch10_Sec1024.6/2220), respectively, of the *International Building Code*.

**Exception:** Fire dampers are not required at penetrations of fire barriers where any of the following apply:

1.Penetrations are tested in accordance with ASTM E119 or [UL 263](https://codes.iccsafe.org/lookup/IMC2021P3_Ch15_PromUL_RefStd263_2011/2220) as part of the fire-resistance-rated assembly.

2.Ducts are used as part of an *approved* smoke control system in accordance with [Section 513](https://codes.iccsafe.org/lookup/IMC2021P3_Ch05_Sec513/2220) and where the fire damper would interfere with the operation of the smoke control system.

3.Such walls are penetrated by fully ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with [Section 903.3.1.1](https://codes.iccsafe.org/lookup/IBC2021P1_Ch09_Sec903.3.1.1/2220) or [903.3.1.2](https://codes.iccsafe.org/lookup/IBC2021P1_Ch09_Sec903.3.1.2/2220) of the *International Building Code*. For the purposes of this exception, a fully ducted HVAC system shall be a duct system for the structure’s HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage [0.0217 inch (0.55 mm)] thickness and shall be continuous from the air-handling *appliance* or *equipment* to the air outlet and inlet terminals. Flexible air connectors shall be permitted in a fully ducted system, limited to the following installations:

3.1.Nonmetallic flexible connections that connect a duct to an air handling unit or *equipment* located within a mechanical room in accordance with [Section 603.9](https://codes.iccsafe.org/lookup/IMC2021P3_Ch06_Sec603.9/2220).

3.2.Nonmetallic flexible air connectors in accordance with [Section 603.6.2](https://codes.iccsafe.org/lookup/IMC2021P3_Ch06_Sec603.6.2/2220) that connect an overhead metal duct to a ceiling diffuser where the metal duct and ceiling diffuser are located within the same room.

M-FBC-M-Ch.7 – Glitch #1

**CHAPTER 7 COMBUSTION AIR**

No change

**CHAPTER 8 CHIMNEYS AND VENTS**

No change

**CHAPTER 9 SPECIFIC APPLIANCES, FIREPLACES AND SOLID FUEL-BURNING EQUIPMENT**

**907.1 General.** Factory built cremation furnaces and commercial direct-fed incinerators shall be listed and labeled in accordance with UL 2790. Factory-built incinerators for domestic applications shall be listed and labeled in accordance with UL 791.Incinerators and ~~crematories~~ cremation furnaces shall be l~~isted and labeled in accordance with UL 791 and shall be~~ installed in accordance with the manufacturer’s instructions.

(M11649 / FG7-21 Part II AS)

**SECTION 912**

**~~INFRARED RADIANT~~**  **ELECTRIC SPACE HEATERS**

**912.1 General.** Permanently installed electric i~~nfrared radiant~~ space heaters shall ~~comply~~ be listed and labeled in accordance with ~~UL 499~~ UL 2021, and installed in accordance with the manufacturer’s instructions.

**912.3 Clearances.** Heaters shall be installed with *clearances* from combustible material in accordance with the manufacturer’s installation instructions.

**Revise as follows:**

**912.2 Support.** ~~Infrared radiant~~ Electric space heaters shall be fixed in a position independent of ~~fuel and~~ electric supply lines. Hangers and brackets shall be noncombustible material.

(M11326 / M61-21 AS)

SECTION 931 STEAM BATH EQUIPMENT

**931.1 General.** Steam bath equipment shall be *listed* and *labeled* in accordance with UL 499 and shall be installed in accordance with their listing and the manufacturer’s instructions.

(M11327 / M62-21 AS)

**CHAPTER 10 BOILERS, WATER HEATERS AND PRESSURE VESSELS**

**1001.1 Scope.** This chapter shall govern the installation, *alteration* and repair of boilers, water heaters and pressure vessels.

Exceptions:

1. Pressure vessels used for unheated water supply.

2. Portable unfired pressure vessels and Interstate Commerce Commission containers.

3. Containers for bulk oxygen and medical gas.

4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within *occupancies* of Groups B, F, H, M, R, S and U.

5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.

6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems.

7. Any boiler or pressure vessel subject to inspection by federal or state inspectors.

8. Pressure vessels used in specific appliances and equipment that are regulated by Chapter 9 of this code.

(M11328 / M63-21AS)

**~~1006.6 Safety and relief valve discharge.~~** ~~Safety and relief valve discharge pipes shall be of rigid pipe that is~~ *~~approved~~* ~~for the temperature of the system. High-pressure-steam safety valves shall be vented to the outside of the structure. The discharge piping serving pressure relief valves, temperature relief valves and combinations of such valves shall:~~

~~1. Not be directly connected to the drainage system.~~

~~2. Discharge through an air break located in the same room as the~~ *~~appliance~~*~~.~~

~~3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break.~~

~~4. Serve a single relief device and shall not connect to piping serving any other relief device or~~ *~~equipment~~*~~.~~

~~5. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors.~~

~~6. Discharge in a manner that does not cause personal injury or structural damage.~~

~~7. Discharge to a termination point that is readily observable by the building occupants.~~

~~8. Not be trapped.~~

~~9. Be installed so as to flow by gravity.~~

~~10. Not terminate more than 6 inches (152 mm) above the floor or waste receptor.~~

~~11. Not have a threaded connection at the end of such piping.~~

~~12. Not have valves or tee fittings.~~

~~13. Be constructed of those materials listed in Section 605.4 of the~~ *~~International Plumbing Code~~* ~~or materials tested, rated and approved for such use in accordance with ASME A112.4.1. Utilize piping material complying with Section 1202.~~

(M11333 / M67-21 AS) Overlap

**CHAPTER 11 REFRIGERATION**

**Add new text as follows:**

**1101.2.1 Group A2L, A2, A3 and B1 high probability equipment.** High probability equipment using Group A2L, A2, A3, or B1 refrigerant shall comply with UL 484, UL/CSA 60335-2-40, or UL/CSA 60335-2-89.

(M11338 / M72-21 AS)

Revise section 1101.5 to read as follows: Section 1101.6 General. Refrigeration systems shall comply with the requirements of this code and, except as modified by this code, ASHRAE 15. Ammonia-refrigerating systems shall comply with this code and, except as modified by this code, ASHRAE 15 and IIAR 2.

Exception: Refrigeration systems that use A2L refrigerant shall be designed and installed in accordance with ASHRAE 15.

**Supplement 5 – Glitch**

Delete and substitute as follows:

**~~1101.8 Change in refrigerant type~~.** ~~The type of refrigerant in refrigeration systems having a refrigerant circuit containing more than 220~~ ~~pounds (99.8 kg) of Group A1 or 30 pounds (13.6 kg) of any other group refrigerant shall not be changed without prior notification to the~~ ~~code official and compliance with the applicable code provisions for the new refrigerant type.~~

**1101.7 Changing Refrigerant.** Changes of refrigerant in an existing system to a refrigerant with a different refrigerant designation shall only be allowed where in accordance with the following:

1. The owner or the owner's authorized agent shall be notified prior to making a change of refrigerant, and the change of refrigerant shall not be made where the owner objects to the change.

2. The change in refrigerant shall be in accordance with one of the following.

2.1 Written instructions of the original equipment manufacturer.

2.2 An evaluation of the system by a registered design professional or by an approved agency that validates safety and suitability of the replacement refrigerant.

2.3 Approved by the code official.

3. Where the replacement refrigerant is classified into the same safety group, requirements that were applicable to the existing system shall continue to apply.

4. Where the replacement refrigerant is classified into a different safety group, the system shall comply with the requirements of this standard for a new installation, and the change of refrigerant shall require code official approval.

**~~1102.2.1 Mixing~~.** ~~Refrigerants, including refrigerant blends, with different designations in ASHRAE 34 shall not be mixed in a system.~~

**~~Exception:~~** ~~Addition of a second refrigerant is allowed where permitted by the~~ *~~equipment~~* ~~or~~ *~~appliance~~* ~~manufacturer to improve oil return~~ ~~at low temperatures. The refrigerant and amount added shall be in accordance with the manufacturer’s instructions.~~

**1102.2.1 Mixing.**

Refrigerants with different refrigerant designations shall only be mixed in a system in accordance with both of the following:

1. The addition of a second refrigerant is allowed by the equipment manufacturer and is in accordance with the manufacturer’s written instructions.

2. The resulting mixture does not change the refrigerant safety group.

(M11369 / M73-21 AMPC1)

**1104.3.1 Air conditioning for human comfort.** ~~In other than industrial occupancies where the quantity in a single independent circuit does~~ ~~not exceed the amount in Table 1103.1, Group B1, B2 and B3 refrigerants shall not be used in high-probability systems for air conditioning~~ ~~for human comfort.~~ High probability systems used for human comfort shall use Group A1 or A2L refrigerant.

**Exceptions:**

1. Equipment listed for and used in residential occupancies containing a maximum of 6.6 pounds (3 kg) of refrigerant.

2. Equipment listed for and used in commercial occupancies containing a maximum of 22 pounds (10 kg) of refrigerant.

3. Industrial occupancies.

**1104.3.2 ~~Nonindustrial occupancies~~ Group A2, A3, B2 and B3 refrigerants.**

Group A2 and B2 refrigerants shall not be used in high-probability systems.  ~~where the quantity of refrigerant in any independent refrigerant circuit exceeds the amount shown in Table 1104.3.2.~~ Group A3 and B3 refrigerants shall not be used except where *approved*.

**~~Exception~~ Exceptions:** This section does not apply to:

1. l~~aboratories~~ Laboratories where the floor area per occupant is not less than 100 square feet (9.3 m2).

2. Listed self contained systems having a maximum of 0.331 pounds (150 g) of Group A3 refrigerant.

3. Industrial occupancies.

4. Equipment listed for and used in residential occupancies containing a maximum of 6.6 pounds (3 kg) of Group A2 or B2 refrigerant.

5. Equipment listed for and used in commercial occupancies containing a maximum of 22 pounds (10 kg) of Group A2 or B2 refrigerant.

**Delete without substitution:**

~~TABLE 1104.3.2 MAXIMUM PERMISSIBLE QUANTITIES OF REFRIGERANTS~~

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **TYPE OF REFRIGERATION SYSTEM** | **MAXIMUM POUNDS FOR VARIOUS OCCUPANCIES** | | | |
| **Institutional** | **Public a ssembly** | **Residential** | **All other occupancies** |
| **Sealed absorption system** |  |  |  |  |
| In exit access | 0 | 0 | 3.3 | 3.3 |
| In adjacent outdoor locations | 0 | 0 | 22 | 22 |
| In other than exit access | 0 | 6.6 | 6.6 | 6.6 |
| **Unit systems** |  |  |  |  |
| In other than exit access | 0 | 0 | 6.6 | 6.6 |

~~For SI: 1 pound = 0.454 kg.~~

(M11371 / M75-21 AM)

**1106.4 ~~Flammable~~Class 2 and 3 refrigerants.** Where refrigerants of Groups A2, A3, B2 and B3 are used, the *machinery room* shall conform to the Class I, Division 2, *hazardous location* classification requirements of NFPA 70.

**~~Exception:~~** *~~Machinery rooms~~* ~~for systems containing Group A2L~~ *~~refrigerants~~* ~~that are provided with ventilation in accordance with~~ ~~Section 1106.4.~~

(M11372 / M77-21 Part I AS)

**CHAPTER 12 HYDRONIC PIPING**

**1201.1 Scope.** The provisions of this chapter shall govern the construction, installation, *alteration* and repair of hydronic piping systems. This chapter shall apply to hydronic piping systems that are part of heating, ventilation and air-conditioning systems. Such piping systems shall include steam, hot water, radiant heating, radiant cooling, chilled water, steam condensate, ~~and~~ ground source heat pump loop systems and snow- and ice-melting. Potable cold and hot water distribution systems shall be installed in accordance with the *Florida Building Code, Plumbing*

*Code*.

(M11427 / M85-21 AS)

**Revise as follows:**

**TABLE 1202.4 HYDRONIC PIPE**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD (see Chapter 15)** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe | ASTM D1527; ASTM F2806 |
| Chlorinated polyvinyl chloride (CPVC) plastic pipe | ASTM D2846; ASTM F441; ASTM F442 |
| Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) | ASTM F2855 |
| Copper or copper-alloy pipe | ASTM B42; ASTM B43; ASTM B302 |
| Copper or copper-alloy tube (Type K, L or M) | ASTM B75; ASTM B88; ASTM B135; ASTM B251 |
| Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe | ASTM F1281; CSA CAN/CSA-B-137.10 |
| Cross-linked polyethylene (PEX) tubing | ASTM F876; ASTM F3253; CSA B137.5 |
| Ductile iron pipe | AWWA C115/A21.15; AWWA C151/A21.51 |
| Lead pipe | FS WW-P-325B |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe | ASTM F1282; CSA B137.9 |
| Polypropylene (PP) plastic pipe | ASTM F2389 |
| Polyvinyl chloride (PVC) plastic pipe | ASTM D1785; ASTM D2241 |
| Raised temperature polyethylene (PE-RT) | ASTM F2623; ASTM F2769; CSA B137.18 |
| Steel pipe | ASTM A53; ASTM A106 |
| Steel tubing | ASTM A254 |

(M11428 / M86-21 AS)

TABLE 1202.4 HYDRONIC PIPE

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD (see Chapter 15)** |
| Acrylonitrile butadiene styrene (ABS) plastic pipe | ASTM D1527; ASTM F2806 |
| Chlorinated polyvinyl chloride (CPVC) plastic pipe | ASTM D2846; ASTM F441; ASTM F442 |
| Chlorinated polyvinyl chloride/aluminum/chlorinated polyvinyl chloride (CPVC/AL/CPVC) | ASTM F2855 |
| Copper or copper-alloy pipe | ASTM B42; ASTM B43; ASTM B302 |
| Copper or copper-alloy tube (Type K, L or M) | ASTM B75; ASTM B88; ASTM B135; ASTM B251 |
| Cross-linked polyethylene/aluminum/cross-linked polyethylene (PEX-AL-PEX) pressure pipe | ASTM F1281; CSA CAN/CSA-B-137.10 |
| Cross-linked polyethylene (PEX) tubing | ASTM F876; ASTM F3253; CSA B137.5 |
| Ductile iron pipe | AWWA C115/A21.15; AWWA C151/A21.51 |
| Lead pipe | FS WW-P-325B |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe | ASTM F1282; CSA B137.9 |
| Polypropylene (PP) plastic pipe | ASTM F2389 |
| Polyvinyl chloride (PVC) plastic pipe | ASTM D1785; ASTM D2241 |
| Raised temperature polyethylene (PE-RT) | ASTM F2623; ASTM F2769; CSA B137.18 |
| Steel pipe | ASTM A53; ASTM A106; |
| Steel tubing | ASTM A254 |
| Stainless Steel pipe | ASTM A269; ASTM A312; ~~ASTM A554~~; ASTM A778 |
| Stainless Steel tubing | ASTM A269; ASTM A312; ~~ASTM A554~~; ASTM A778 |

(M11429 / M87-21 AM)

TABLE 1202.5 HYDRONIC PIPE FITTINGS

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD (see Chapter 15)** |
| Copper and copper  alloys | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974 ; ASTM F3226 |
| CPVC | ASSE 1061; ASTM D2846; ASTM F438; ASTM F439 |
| Ductile iron and gray iron | ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53 |
| Ductile iron | ANSI/AWWA C153/A21.53 |
| Gray iron | ASTM A126 |
| Malleable iron | ASME B16.3 |
| PE-RT fittings | ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769; CSA B137.1; CSA B137.18 |
| PEX fittings | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253 |
| Plastic | ASTM D2466; ASTM D2467; ASTM D2846; ASTM F877; ASTM F2389; ASTM F2735 |
| Steel | ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548; ASTM F3226 |
| Stainless Steel | ASTM A269; ASTM A312; ~~ASTM A554~~; ASTM A778; ASTM F3226 |

(M11430 / M88-21 AM)

**Revise as follows:**

**TABLE 1210.5 GROUND-SOURCE LOOP PIPE FITTINGS**

|  |  |
| --- | --- |
| **PIPE MATERIAL** | **STANDARD (see Chapter 15)** |
| Chlorinated polyvinyl chloride (CPVC) | ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 |
| Cross-linked polyethylene (PEX) | ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434;ASTM F3347; CSA B137.5; CSA C448; NSF 358-3 |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) | ASTM F1282; ASTM F2434; CSA B137.9 |
| High-density polyethylene (HDPE) | ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1 |
| Polypropylene (PP-R) | ASTM F2389; CSA B137.11; NSF 358-2 |
| Polyvinyl chloride (PVC) | ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 |
| Raised temperature polyethylene (PE-RT) | ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769;ASTM F3347; CSA B137.1; CSA B137.18; CSA C448; NSF 358-4 |

**TABLE 1202.5 HYDRONIC PIPE FITTINGS**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD (see Chapter 15)** |
| Copper and copper alloys | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974 |
| CPVC | ASSE 1061; ASTM D2846; ASTM F438; ASTM F439 |
| Ductile iron and gray iron | ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53 |
| Ductile iron | ANSI/AWWA C153/A21.53 |
| Gray iron | ASTM A126 |
| Malleable iron | ASME B16.3 |
| PE-RT fittings | ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769;ASTM F3347; CSA B137.1; CSA B137.18 |
| PEX fittings | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253;ASTM F3347 |
| Plastic | ASTM D2466; ASTM D2467; ASTM D2846; ASTM F877; ASTM F2389; ASTM F2735 |
| Steel | ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548 |

(M11444 / M99-21 Part I AS)

**1203.20 Stainless Steel Pipe.** Joints between stainless steel pipe or fittings shall be mechanical joints that are made with an approved elastomeric seal, or shall be threaded or welded joints conforming to Section 1203.3.

**1203.21 Stainless Steel Tubing.** Joints between stainless steel tubing or fittings shall be mechanical or welded joints conforming to Section 1203.3.

(M11438 / M91-21 AS)

**1203.3.4 Solvent-cemented joints.** Joint surfaces shall be clean and free from moisture. An *approved* primer shall be applied to CPVC and PVC pipe-joint surfaces. Joints shall be made while the cement is wet. Solvent cement conforming to the following standards shall be applied to all joint surfaces:

1. ASTM D2235 for ABS joints.

2. ASTM F493 for CPVC joints.

3. ASTM D2564 for PVC joints.

CPVC joints shall be made in accordance with ASTM D2846.

**Exception:** For CPVC pipe joint connections, a primer is not required where all of the following conditions apply:

1. The solvent cement used is third-party certified as conforming to ASTM F493.

2. The solvent cement is yellow or green in color.

3. The solvent cement is used only for joining 1/2-inch (12.7 mm) through 2-inch (51 mm) diameter CPVC pipe and fittings.

4. The CPVC pipe or fittings are manufactured in accordance with ASTM D2846.

(M11431 / M89-21 AS)

**~~1203.11 Polybutylene plastic pipe and tubing~~.** ~~Joints between polybutylene plastic pipe and tubing or fittings shall be mechanical joints~~ ~~conforming to Section 1203.3 or heat-fusion joints conforming to Section 1203.9.1.~~

**~~1203.11.1 Heat-fusion joints~~.** ~~Joints shall be of the socket-fusion or butt-fusion type. Joint surfaces shall be clean and free from moisture.~~ ~~Joint surfaces shall be heated to melt temperatures and joined. The joint shall be undisturbed until cool. Joints shall be made in accordance~~ ~~with ASTM D3309.~~

(M11434 / M90-21 AS)

**1205.1 Where required.** Shutoff valves shall be installed in hydronic piping systems in the locations indicated in Sections 1205.1.1 through 1205.1.6. Access shall be provided to all full open valves and shutoff valves.

(M11439 / M92-21 AS)

**1209.1 Materials.** Piping for heating panels shall be standard-weight steel pipe, Type L copper tubing,~~polybutylene~~ or ~~other~~ *approved*

plastic pipe or tubing rated at 100 psi (689 kPa) at 180°F (82°C).

(M11441 / M95-21 AS)

**~~1209.3.3 Polybutylene joints~~.** ~~Polybutylene pipe and tubing shall be installed in continuous lengths or shall be joined by heat fusion in~~ ~~accordance with Section 1203.9.1.~~

(M11442 / M96-21 AS)

**1209.6 Radiant tubing placement.** Hydronic tubing to be embedded for the purpose of radiant heating or cooling shall be installed in accordance with the manufacturer’s instructions and with the tube layout and spacing in accordance with the system design. Individual tubing circuit lengths shall be installed with a variance of not more than ±10 percent from the design.

**1209.6.1 Radiant tubing circuit length.** The maximum circuit length of radiant tubing from a supply-and-return manifold shall not exceed the lengths specified by the system design or, in the absence of manufacturer’s specifications, the lengths specified in Table 1209.6.1.

**TABLE 1209.6.1 MAXIMUM CIRCUIT LENGTH OF RADIANT TUBING FROM A SUPPLY-AND-RETURN MANIFOLD ARRANGEMENT**

|  |  |
| --- | --- |
| **NOMINAL TUBE SIZE** | **MAXIMUM CIRCUIT LENGTH (FEET)** |
| 1/4 | 125 |
| 5/16 | 200 |
| 3/8 | 250 |
| 1/2 | 300 |
| 5/8 | 400 |
| 3/4 | 500 |
| 1 | 750 |

For SI units: 1 foot = 304.8 mm

**1209.6.2 Radiant tubing circuit tags.** Each individual radiant tubing circuit shall have a tag or label securely affixed to each manifold outlet to indicate the length of each circuit and the areas served.

**1209.6.3 Radiant tubing drawings.** The radiant tubing drawings and design report shall be provided to the building owner or the designated representative of the building owner.

(M11669 / M97-21 AS)

**1210.4 Piping and tubing materials standards.** Ground-source heat pump ground-loop pipe and tubing shall conform to the standards listed in Table 1210.4.

**Revise as follows:**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD (see Chapter 15)** |
| Chlorinated polyvinyl chloride (CPVC) | ASTM D2846; ASTM F441; ASTM F442 |
| Cross-linked polyethylene (PEX) | ASTM F876; ASTM F3253; CSA B137.5; CSA C448; NSF 358-3 |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) pressure pipe | ASTM F1282; CSA B137.9 |
| High-density polyethylene (HDPE) | ASTM D2737; ASTM D3035; ASTM F714; AWWA C901; CSA B137.1; CSA C448; NSF 358-1 |
| Polypropylene (PP-R) | ASTM F2389; CSA B137.11; NSF 358-2 |
| Polyvinyl chloride (PVC) | ASTM D1785; ASTM D2241 |
| Raised temperature polyethylene (PE-RT) | ASTM F2623; ASTM F2769; CSA B137.18; CSA C448; NSF 358-4 |

**TABLE 1210.4 GROUND-SOURCE LOOP PIPE**

(M11440 / M93-21 AS)

**TABLE 1210.5 GROUND-SOURCE LOOP PIPE FITTINGS**

|  |  |
| --- | --- |
| **PIPE MATERIAL** | **STANDARD (see Chapter 15)** |
| Chlorinated polyvinyl chloride (CPVC) | ASTM D2846; ASTM F437; ASTM F438; ASTM F439; CSA B137.6 |
| Cross-linked polyethylene (PEX) | ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F2434;ASTM F3347; CSA B137.5; CSA C448; NSF 358-3 |
| Polyethylene/aluminum/polyethylene (PE-AL-PE) | ASTM F1282; ASTM F2434; CSA B137.9 |
| High-density polyethylene (HDPE) | ASTM D2683; ASTM D3261; ASTM F1055; CSA B137.1; CSA C448; NSF 358-1 |
| Polypropylene (PP-R) | ASTM F2389; CSA B137.11; NSF 358-2 |
| Polyvinyl chloride (PVC) | ASTM D2464; ASTM D2466; ASTM D2467; CSA B137.2; CSA B137.3 |
| Raised temperature polyethylene (PE-RT) | ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769;ASTM F3347; CSA B137.1; CSA B137.18; CSA C448; NSF 358-4 |

**TABLE 1202.5 HYDRONIC PIPE FITTINGS**

|  |  |
| --- | --- |
| **MATERIAL** | **STANDARD (see Chapter 15)** |
| Copper and copper alloys | ASME B16.15; ASME B16.18; ASME B16.22; ASME B16.24; ASME B16.26; ASME B16.51; ASSE 1061; ASTM F1974 |
| CPVC | ASSE 1061; ASTM D2846; ASTM F438; ASTM F439 |
| Ductile iron and gray iron | ANSI/AWWA C110/A21.10; ASTM A395; ASTM A536; ASTM F1476; ASTM F1548; AWWA C153/A21.53 |
| Ductile iron | ANSI/AWWA C153/A21.53 |
| Gray iron | ASTM A126 |
| Malleable iron | ASME B16.3 |
| PE-RT fittings | ASSE 1061; ASTM D3261; ASTM F1807; ASTM F2098; ASTM F2159; ASTM F2735; ASTM F2769;ASTM F3347; CSA B137.1; CSA B137.18 |
| PEX fittings | ASSE 1061; ASTM F877; ASTM F1807; ASTM F1960; ASTM F2080; ASTM F2159; ASTM F3253;ASTM F3347 |
| Plastic | ASTM D2466; ASTM D2467; ASTM D2846; ASTM F877; ASTM F2389; ASTM F2735 |
| Steel | ASME B16.5; ASME B16.9; ASME B16.11; ASME B16.28; ASTM A53; ASTM A106; ASTM A234; ASTM A395; ASTM A420; ASTM A536; ASTM F1476; ASTM F1548 |

(M11446 / M100-21 Part I AS)

**1210.6 Joints.** Joints and connections shall be of an approved type. Joints and connections shall be tight for the pressure of the ground- source loop system. Joints used underground shall be of an approved type for buried applications.

(M11448 / M101-21 AS)

**CHAPTER 13 FUEL OIL PIPING AND STORAGE**

Revise title for Table 1302.3 as follows:

**TABLE 1302.3 FUEL OIL PIPING and Fittings**

M-FBC-M – Ch.13 – Errata #1

**CHAPTER 14 SOLAR SYSTEMS**

No Change

**CHAPTER 15 REFERENCED STANDARDS**

CHAPTER 15 REFERENCED STANDARDS Revise as follows: ASHRAE 15-~~2019~~2022 Safety Standard for Refrigeration Systems including all addenda published until July 31, 2024 ……………………….1101.6, 1105.8, 1108.

**Supplement 5 – Glitch**

Add new standard(s) as follows:

UL LLC

**UL**

333 Pfingsten Road

Northbrook, IL 60062-2096

UL 2021-15 Fixed and Location-Dedicated Electric Room Heaters (with revisions through December 14, 2016)

(M11326 / M61-21 AS)

Add new standard(s) as follows:

UL LLC

**UL**

333 Pfingsten Road

Northbrook, IL 60062-2096

921-20 Standard for Commercial Dishwashers

(M11317 / M45-21 AS)

Add new standard(s) as follows:

UL LLC

**UL**

333 Pfingsten Road

Northbrook, IL 60062-2096

2790-2010 Commercial Incinerators - with revisions through June, 2019

(M11649 / FG7-21 Part II AS)

Revise as follows:

UL LLC

**UL**

333 Pfingsten Road

Northbrook, IL 60062-2096

UL/CSA 60335-2-40—~~17~~2019 Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical Heat Pumps, Air-Conditioners and Dehumidifiers

(M11333 / M67-21 AS)

Add new standard(s) as follows:

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

A778/A778M-16 Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

(M11430 / M88-21 AM)

Add new standard(s) as follows:

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

ASTM A554-16 Standard Specification for Welded Stainless Steel Mechanical Tubing

Add new text as follows:

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

ASTM A778/A778M-16 Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products

(M11429 / M87-21 AM)

Add new standard(s) as follows:

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

F3347-20a Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(M11440 / M93-21 AS)

**ASTM**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

F3347-20a Standard Specification for Metal Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(M11444 / M99-21 Part I AS)

**Add new standard(s) as follows:**

ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428

**ASTM**

ASTM F3348-20b Standard Specification for Plastic Press Insert Fittings with Factory Assembled Stainless Steel Press Sleeve for SDR9 Cross-linked Polyethylene (PEX) Tubing and SDR9 Polyethylene of Raised Temperature (PE-RT) Tubing

(M11446 / M100-21 Part I AS)

**Revise as follows:**

**UL**

UL LLC

333 Pfingsten Road

Northbrook, IL 60062-2096

UL/CSA 60335-2-40—~~17~~2019 Household and Similar Electrical Appliances—Safety—Part 2-40: Particular Requirements for Electrical

Heat Pumps, Air-Conditioners and Dehumidifiers

(M11338 / M72-21 AS)

**Revise as follows:**

ASHRAE1791 Tullie Circle NE Atlanta, GA 30329

ASHRAE ASHRAE/ASHE

Ventilation of Health Care Facilities

~~170—2017~~

170-2021

(M11297 / M21-21 AM)

New Appendix

**Appendix D Clear Air Delivery**

**SECTION D101—GENERAL**

**D101.1 Clean air delivery capability.** In Group A, B, E and I *occupancies*, each mechanical system shall meet the

requirements in Section D101.1.1.

**Exception:** Occupiable spaces where 100 percent of the supply air meets high-efficiency particulate air

filtration.

**D101.1.1 Airflow for increased filtration.** Mechanical systems shall be sized to accommodate a design airflow

at a total static pressure drop that assumes the utilization of a supply air filter with a Minimum Efficiency Reporting Value (MERV) of not less than 13.

(M11301 / M25-21 AMPC1,2)

**Appendix E Clean Air Delivery**

Appendix E Clean Air Delivery

**User Note .** *The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.*

***About this appendix:*** *Appendix E provides criteria for an increased protection level for occupant health by delivering and monitoring clean air in occupied areas of the certain buildings.*

**D101 Demand control ventilation .** Group A, B, E and I occupancies shall be equipped with a minimum of one carbon dioxide sensor for every 500 square feet of occupiable space. Carbon dioxide sensors installed in accordance with this section shall meet the requirements in Sections D101.1 and D101.3. Mechanical equipment serving each zone(s) shall be equipped with controls which meet the requirements in Section D101.2.

**Exception:** Occupiable zones less than 500 square feet.

**D101.1 Carbon dioxide sensor performance specifications .** Each carbon dioxide sensor installed in accordance with Section D101 shall meet the following carbon dioxide measurement specifications as certified by the equipment manufacturer:

1. Range lower bound less than or equal to 400 parts per million

2. Range upper bound greater than or equal to 2,000 parts per million

3. Accuracy within ±75 parts per million at a reading of 1,000 parts per million

4. Output resolution less than or equal to 20 parts per million

**D101.2 Mechanical system controls .** Controls for the mechanical equipment installed in accordance with Section D101 shall:

1. Receive data from the carbon dioxide sensor in the occupiable zone(s) at least once per 5 minutes

2. Be calibrated to provide pre-established outdoor airflow rates, or be equipped with the necessary instrumentation to measure the outdoor airflow rate

3. Be capable of adjusting the outdoor airflow rate in response to an adjustable outdoor airflow setpoint

4. Increase the amount of outdoor air provided to each occupiable zone until the carbon dioxide level in each occupiable zone falls below a maximum threshold as defined by the user

**D101.3 Carbon dioxide detection threshold level .** The default detection threshold level for carbon dioxide measurement above which triggers an alert in accordance with Section D101.4 shall be set to 1,100 parts per million. The end user can modify the detection threshold level based on specific operations and needs.

**D101.4 Carbon dioxide detection threshold level exceeded .** When carbon dioxide levels exceed the detection threshold level established in Section D101.3, the mechanical equipment shall modify the outdoor airflow rate as required in Section D101.2. When the carbon dioxide concentration remains above the detection threshold level for a period of 30 minutes or more, the occupants in the zone shall be alerted by approved audible and visual notification devices or through a building monitoring system.

(M11302 / M26-21 AMPC1)