

**CITY OF PHOENIX ADOPTED
2006 INTERNATIONAL MECHANICAL CODE (IMC) AMENDMENTS**

IMC Chapter 3 to be revised as follows:

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. Nonmetallic piping shall not be installed in exterior locations. All components shall be selected for the pressure and temperature rating of the installation. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal. Where the drain pipes from more than one unit are manifolded together for condensate drainage, the pipe or tubing shall be sized in accordance with this section or an approved method. All horizontal sections of drain piping shall be installed in uniform alignment at a uniform slope of not less than one-eighth unit vertical in 12 units horizontal (1 %). Condensate waste pipes shall be sized in accordance with equipment capacity as follows:

Equipment Capacity in Tons of Refrigeration (kW) Minimum Pipe Diameter in Inches (mm)

<u>Up to 20 tons</u> <u>(Up to 70.34)</u>
<u>$\frac{3}{4}$</u> <u>(20)</u>
<u>21 – 40</u> <u>(73.85 – 140.67)</u>
<u>1</u> <u>(25)</u>
<u>41 – 90</u> <u>(144.19 – 316.6)</u>
<u>1-1/4</u> <u>(32)</u>
<u>91 – 125</u> <u>(320.03 – 439.6)</u>
<u>1-1/2</u> <u>(40)</u>
<u>126 - 250</u> <u>(443.12 – 879.2)</u>
<u>2</u> <u>(50)</u>

Condensate drain pipe sizing for other slopes or other conditions shall be approved by the Administrative Authority.

**[B] SECTION 309
TEMPERATURE CONTROL**

[B] 309.1 ~~Space heating systems.~~ Heating and Cooling. Habitable spaces ~~Interior spaces intended for human occupancy~~ shall be provided with active or passive space-heating and space-cooling systems capable of maintaining a ~~minimum indoor~~ temperatures between 70 of 68°F (21°C) and 90°F (50°C) at a point 3 feet (914 mm)

above ~~the floor on the design heating day~~. The installation of portable space heaters or coolers shall not be used to achieve compliance with this section.

Exception: Interior spaces where the primary purpose is not associated with human comfort.

IMC Chapter 4 to be revised as follows:

403.2 Outdoor air required. The minimum ventilation rate of outdoor air shall be determined in accordance with Section 403.3.

Exception: Where the registered design professional demonstrates that an engineered ventilation system design ~~will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.~~ meets the requirements of ASHRAE Standard 62.1- 2004 Ventilation for Acceptable Indoor Air Quality.

403.3.4 Balancing. Ventilation systems shall be balanced ~~by an approved~~ using a nationally accepted air balancing test method. Such balancing shall verify that the ventilation system is capable of supplying the air flow rates required by Section 403. A final report shall be provided to the engineer of record and the mechanical inspector. Air balance reports are not required to be sealed by a professional engineer.

Exception: Residential occupancies shall be exempt from this provision.

SECTION 407 **EVAPORATIVE COOLING SYSTEMS**

407.1. General. Evaporative cooling systems shall comply with this section.

407.1.1 Outside air. Outside air shall be provided as specified in Section 403.2.

407.1.2 Duct systems and dampers. Air ducts and dampers, which are a portion of an evaporative cooling system, shall comply with Chapter 6.

407.1.3 Water supply. Water supplies and backflow protection shall be as required by the Uniform Plumbing Code.

407.1.4 Drainage. Overflow drains shall be provided that discharge to an approved disposal location and comply with the Uniform Plumbing Code.

407.2 Location. Evaporative cooling systems shall be installed so as to minimize the probability of damage from an external source.

407.3 Access, inspection, and repair. Evaporative coolers shall be accessible for inspection, service and replacement without removing permanent construction.

407.4 Installation. An evaporative cooler supported by the building structure shall be installed on a substantial level base and shall be secured directly or indirectly to the building structure by suitable means to prevent displacement of the cooler.

Modifications made to the supporting framework of buildings as a result of the installation shall be made in accordance with the requirements of the Building Code. Openings in exterior walls shall be flashed in an approved manner in accordance with the Building Code.

An evaporative cooler supported directly by the ground shall be isolated from the ground by a level concrete slab extending not less than three (3) inches (76 mm) above the adjoining ground level.

An evaporative cooler supported on an aboveground platform shall be elevated at least six (6) inches (152 mm) above adjoining ground level.

407.5 Relief. A permanent relief opening or other engineered design sufficient to assure positive airflow shall balance intake air.

IMC Chapter 5 to be revised as follows:

502.14 Motor vehicle operation. In areas where motor vehicles operate, mechanical ventilation shall be provided in accordance with Section 403. Additionally, areas in which stationary motor vehicles are operated shall be provided with a source capture system that connects directly to the motor vehicle exhaust systems. Makeup air for exhaust systems in areas where motor vehicles operate shall be provided through permanent unobstructed openings to the outdoors such as louvers or grills. Mechanical equipment and louvers used for makeup air purposes shall be electrically interlocked with the exhaust system.

Exceptions:

1. This section shall not apply where the motor vehicles being operated or repaired are electrically powered.
2. This section shall not apply to one- and two-family dwellings.
3. This section shall not apply to motor vehicle service areas where engines are operated in side the building only for the duration necessary to move the motor vehicles in and out of the building.

504.6.1 Maximum length. The maximum length of a clothes dryer exhaust duct shall not exceed 25 ft (7620 mm) from the dryer location to the outlet terminal. The maximum length of duct shall be reduced 2½ feet for each 45-degree (0.79 rad) bend and 5 feet (1524 mm) for each 90-degree (1.6 rad) bend. The maximum length of the exhaust duct does not include the transition duct.

Exceptions:

1. Where the make and model of the clothes dryer to be installed is known and the manufacturer's installation instructions for such dryer are provided to the code official, the maximum length of the exhaust duct, including any transition duct, shall be permitted to be in accordance with the dryer manufacturer's installation instructions.
2. Where the make and model of the clothes dryer is not known, the installed length and number of elbows of the dryer exhaust duct shall be posted in a conspicuous location. A permanently installed plaque of minimum dimensions of 3 inch (76 mm) by 4 inch (102 mm) shall be affixed on the wall near the interior duct outlet that states: "Warning Do Not Remove. To avoid the risk of fire caused by lint build-up in the exhaust duct, all domestic dryers installed at this location shall be manufacturer approved (listed) for connection to an exhaust duct that is () feet or greater in length with () elbows."

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~~ ~~brazed~~ made on the external surface of the 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.

506.3.10 Grease duct enclosure. A grease duct serving a Type I hood that penetrates a ceiling, wall or floor shall be enclosed from the point of penetration to the outlet terminal. A duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. Ducts shall be enclosed in accordance with the *International Building Code* requirements for shaft construction. The duct enclosure shall be sealed around the duct at the point of penetration and vented to the outside of the building through the use of weather-protected openings. Clearance from the duct to the interior surface of enclosures of combustible construction shall be not less than 18 inches (457 mm). Clearance from the duct to the interior surface of enclosures of noncombustible construction or gypsum wall board attached to noncombustible structures shall be not less than 6 inches (152 mm). The duct enclosure shall serve a single grease exhaust duct system and shall not contain any other ducts, piping, wiring or systems.

Exceptions:

1. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system classified in accordance with ASTM E 814 and having an "F" and "T" rating equal to the fire-resistance rating of the assembly being penetrated and where the surface of the duct is continuously covered on all sides from the point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified and labeled material, system, method of

construction or product specifically evaluated for such purpose, in accordance with ASTM E 2336. Exposed ductwrap systems shall be protected where subject to physical damage. Installation of this system shall be performed as required under the **Special Inspection** requirements of Section 2803 of the *International Building Code*.

2. The shaft enclosure provisions of this section shall not be required where a duct penetration is protected with a through-penetration firestop system classified in accordance with ASTM E 814 and having an “F” and “T” rating equal to the fire resistance rating of the assembly being penetrated and where a prefabricated grease duct enclosure assembly is protected on all sides from the point at which the duct penetrates a ceiling, wall or floor to the outlet terminal with a classified and labeled prefabricated system specifically evaluated for such purposes in accordance with UL 2221. Installation of this system shall be performed as required under the **Special Inspection** requirements of Section 2803 of the *International Building Code*.
3. A duct enclosure shall not be required for a grease duct that penetrates only a nonfire-resistance-rated roof/ceiling assembly.

507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2. 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.

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke, such as occurs with griddles, fryers, broilers, ovens, ranges and wok ranges.

Exception: Ovens that primarily produce low heat (600 °F or 316 °C), in addition to odor or steam, may be served by Type II hoods without fire extinguishing systems.

~~**507.2.1.1 Operation.** Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods.~~

IMC Chapter 6 to be revised as follows:

606.2.1 Return Air Distribution Systems. Smoke detectors shall be installed in return air distribution systems downstream of the air filters and ahead of any branch connections in systems having with a design capacity greater than 2,000 cfm (0.9 m³/s), in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances.

Exception: Smoke detectors are not required in the return air system where all portions of the building served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the *International Fire Code*. The area smoke detection system shall comply with Section 606.4.

606.2.2 Common supply and return air systems. Where multiple air-handling systems share common supply or return air ducts or plenums with a combined design capacity greater than 2,000 cfm (0.9m³/s), the return air distribution system shall be provided with smoke detectors in accordance with Section 606.2.1.

Exception: Individual smoke detectors shall not be required for each fan-powered terminal unit, provided that such units do not have an individual design capacity greater than 2,000 cfm (0.9 m³/s) and will be shut down by activation of one of the following:

1. Smoke detectors required by Sections 606.2.1 and 606.2.3.
2. An approved area smoke detector system located in the return air plenum serving such units.
3. An area smoke detector system as prescribed in the exception to Section 606.2.1.

In all cases, the smoke detectors shall comply with Sections 606.4 and 606.4.1.

606.5 Factory installed equipment. Smoke detectors that are factory installed in listed air distribution equipment may be used in lieu of smoke detectors installed in the return air duct served by such equipment, except where prohibited by the provisions of Section 606.2.1.

606.6 Testing. Smoke detectors shall be tested by an approved testing agency or a qualified third party Special Inspector. The Special Inspector/testing agency shall be an independent third party individual or firm and shall not be the installing contractor. Special inspections shall be as specified in Section 2802 of the *International Building Code*.

[B] 607.2 Installation. Fire dampers, smoke dampers, combination fire/smoke dampers and ceiling radiation dampers located within air distribution and smoke control systems shall be installed in accordance with the requirements of this section, and the manufacturer's installation instructions and listing. Dampers shall be tested by an approved testing agency or a qualified third party Special Inspector. The Special Inspector/testing agency shall be an independent third party individual or firm and shall not be the installing contractor. Special inspections shall be as specified in Section 2802 of the *International Building Code*.

607.2.1 Smoke control system. Where the installation of a fire damper will interfere with the operation of a required smoke control system in accordance with Section 513, approved alternative protection shall be utilized.

607.2.2 Hazardous exhaust ducts. Fire dampers for hazardous exhaust duct systems shall comply with Section 510.

IMC Chapter 9 to be revised as follows:

SECTION 927
WOODSTOVE/FIREPLACE INSTALLATIONS

927.1 Definitions. For the purposes of this Section, the following words and terms shall have the meaning ascribed thereto:

FIREPLACE: Means a built-in-place masonry hearth and fire chamber or a factory-built appliance, designed to burn solid fuel or to accommodate gas or electric log insert or similar device, and which is intended for occasional recreational or aesthetic use, not for cooking, heating, or industrial processes.

SOLID FUEL: Means and includes, but is not limited to, wood, coal, or other nongaseous or non-liquid fuels, including those fuels defined by the Maricopa County Air Pollution Control Officer as "inappropriate fuel" to burn in residential woodburning devices.

WOOD STOVE: Means a solid-fuel-burning heating appliance including a pellet stove, with is either freestanding or designed to be inserted into a fireplace.

927.2 General. In accordance with the Phoenix City Council adopted Ordinance G4062, on or after December 31, 1998, no person, firm, or corporation shall construct or install a fireplace or a woodstove, and the City shall not approve or issue a permit to construct or install a fireplace or a woodstove, unless the fireplace or woodstove complies with one (1) of the following:

1. A fireplace which has permanently installed gas or electric log insert;
2. A fireplace, woodstove, or other solid-fuel-burning appliance which has been certified by the United States Environmental Protection Agency as conforming to 40 Code of Federal Regulations Part 60, Subpart AAA;
3. A fireplace, woodstove, or other solid-fuel-burning appliance that has been tested and listed by a nationally recognized testing agency to meet performance standards equivalent to those adopted by 40 Code of Federal Regulations Part 60, Subpart AAA;
4. A fireplace, woodstove, or other solid-fuel-burning appliance that has been determined by the Maricopa County Air Pollution Control Officer to meet performance standards equivalent to those adopted by 40 Code of Federal Regulations Part 60, Subpart AAA; or
5. A fireplace that has a permanently installed woodstove insert that complies with paragraphs 2, 3, or 4 above.

Exceptions: The following installations are not regulated and are not prohibited by this Section:

1. Furnaces, boilers, incinerators, kilns, and other similar space heating or industrial process equipment;
2. Cook stoves, barbecue grills, and similar appliances designed primarily for cooking;
3. Fire pits, barbecue grills, and other outdoor fireplaces.

Fireplaces constructed or installed on or after December 31, 1998, that contain a gas or electric log insert or a woodstove insert, shall not be altered to directly burn wood or any other solid fuel. On or after December 31, 1998, no person, firm, or corporation shall alter a fireplace, woodstove, or other solid-fuel-burning appliance in any manner that would void its certification or operational compliance with the provisions of this Section.

Fireplaces constructed or installed on or after December 31, 1998, shall not be altered without first obtaining a permit from the City to insure compliance with this Section.

IMC Chapter 11 to be revised as follows:

1105.3 Refrigerant detector. ~~Refrigerant detectors in machinery rooms shall be provided as required by section 606.8 of the *International Fire Code*.~~ Machinery rooms shall contain a refrigerant detector with an audible and visual alarm. The alarm signaling device(s) shall provide a sound level of at least 15 dBA above the operating ambient noise level of the space in which they are installed. Such device shall also provide an approved distinctive visual alarm. The detector or sampling tube that draws air to the detector shall be located in an area where refrigerant from a leak may be expected to concentrate. The alarm shall be actuated at a value not greater than the corresponding TLV-TWA values shown in Table 1103.1. Detectors and alarms shall be placed in one or more locations to assure notification of all occupants.

1105.10 Dimensions. Refrigeration machinery rooms shall be of such dimensions that all system parts are readily accessible with adequate space for maintenance and operations. An unobstructed walking space at least three (3) feet (914 mm) in width and six (6) feet eight (8) inches (2032 mm) in height shall be maintained throughout allowing free access to at least two sides of all moving machinery and approaching each stop valve. Access to refrigeration machinery rooms shall be restricted to authorized personnel and posted with a permanent sign.

IMC Chapter 15 to be revised as follows:

Chapter 15 Referenced Standards

Recommend that a reference be added to ASHRAE Standard 62.1-2004 Ventilation for Acceptable Indoor Air Quality to go with proposed amendment to 2006 IMC 403.2. The table format may need to be adjusted to match existing.

ASHRAE
Standard
Reference
Number
Title

Referenced
in code
section number

ASHRAE - 2001
ASHRAE Fundamentals Handbook—2001

312.1, 603.2

15-2001 Safety Standard for Refrigeration Systems	1101.6, 1105.8, 1108.1
34-2004 Designation and Safety Classification of Refrigerants	202, 1102.2.1, 1103.1
<u>62.1-2004</u> <u>Ventilation for Acceptable Indoor Air Quality</u>	<u>403.2</u>
ASHRAE - 2000 HVAC Systems and Equipment Handbook—2000	312.1