

## Chapter Comm 64 Heating, Ventilating and Air Conditioning

### Subchapter I— Purpose, Scope, Application and Compliance

**Comm 64.0001 Purpose and scope. (1) PURPOSE.** (a) The purpose of this chapter is to regulate the design, installation, operation and maintenance of heating, ventilating and air conditioning systems in buildings and structures as specified in ch. Comm 61.

(b) The installation of fuel gas distribution piping and equipment, fuel gas-fired appliances and fuel gas-fired appliance venting systems shall be regulated by ch. Comm 65.

(c) Fixed electric space heating equipment shall comply with ch. Comm 16.

**(2) SCOPE.** The scope of this chapter is as specified in s. Comm 61.02.

**Comm 64.0002 Application. (1) GENERAL.** The application of this chapter is as specified in s. Comm 61.03 and as modified in this section.

**(2) APPLICABILITY.** All heating, ventilating and air conditioning systems shall be designed, installed, maintained and operated so as to provide the service and results required within the provisions of this chapter. The minimum requirements established in each part of this chapter shall be complied with as they apply to the structures and facilities covered in the IBC.

**Note:** The administrative rules pertaining to energy conservation, ch. Comm 63, may be applied retroactively to existing buildings and structures.

**(3) EXISTING SYSTEMS.** The provisions for existing systems shall be as specified in pars. (a) and (b).

(a) *Additions.* 1. The provisions of this chapter shall apply to all additions to existing buildings and structures as specified in s. Comm 61.03.

2. Except when an existing heating, ventilation and air conditioning system is extended to serve an addition, existing system components are not required to be replaced if the provisions in this chapter are met within the addition.

(b) *Alterations.* 1. The provisions of this chapter shall apply to all alterations in any building or structure which affect the replacement of major equipment as specified in s. Comm 61.03.

2. When an existing heating, ventilating and air conditioning system serves a remodeled or altered space that has not undergone a change in occupancy classification, the existing system

components are not required to be replaced if the provisions in this chapter that applied to the original construction of the space are met.

**Note:** “Occupancy classification” refers to the entries in Table 64.0403.

**Note:** Compliance with this chapter shall not constitute assurance of proper installation or operation of the heating, ventilating and air conditioning system. This chapter is not to be used as a design manual, but it is established as a minimum standard for safety, health and general welfare of the public.

**Note:** Maintenance and repair to existing equipment when there is no change to the building or occupancy, is considered an alteration.

**(4) RETROACTIVITY.** Retroactivity shall apply as specified in s. Comm 61.03.

**(5) CONFLICTS.** Conflicts between rules and other requirements shall apply as specified in s. Comm 61.03.

**Comm 64.0003 Compliance.** All buildings and structures shall comply with the IMC and the changes, additions or omissions under subch. II.

**Comm 64.0004 Approval of drawings and specifications.** All drawings and specifications shall be submitted to the department in accordance with the provisions of subch. III, ch. Comm 61.

## **Subchapter II — Changes, Additions or Omissions to the International Mechanical Code (IMC)**

**Comm 64.0100 Changes, additions or omission to the International Mechanical Code® (IMC).** Changes, additions or omission to the international mechanical code are specified in this subchapter and are rules of the department and are not requirements of the IMC.

**Note:** This code subchapter is numbered to correspond to the numbering used within the model code; i.e., s. Comm 64.0102 refers to section IMC 102.

**Comm 64.0101 General. (1) ADMINISTRATION.** (a) The requirements in IMC section 101 are not included as part of this chapter.

(b) The requirements in IMC sections 102.1, 102.2, 102.4 to 102.7 and 102.9 are not included as part of this chapter.

**(2) SCOPE.** The requirements of IMC sections 103 to 107, 108.1 to 108.6 and 109 are not included as part of this chapter.

**Comm 64.0102 Applicability.** This is a department rule in addition to the requirements in IMC section 102.3:

(1) The designer or installer shall provide the owner with written instructions for the operation and maintenance of the system and equipment. An operating and maintenance manual shall be provided to the building owner or operator. The manual shall include basic data relating to the operation and maintenance of HVAC systems and equipment.

(2) Required routine maintenance actions shall be clearly identified. Where applicable, HVAC controls information such as diagrams, schematics, control sequence descriptions, and maintenance and calibration information shall be included.

**Comm 64.0202 Definitions.** (1) ADDITIONS. These are department definitions in addition to the definitions in IMC section 202:

(a) "Air change" means the introduction of new, cleaned, or recirculated air to a space.

(b) "Air change rate" means airflow in volume units per hour divided by the building space volume in identical volume units.

(c) "DHFS" means the department of health and family services.

(d) "Spot heating" means to provide heat to raise the air temperature to the required minimum in the immediate area of the occupants.

(2) SUBSTITUTIONS. Substitute the following meanings for the corresponding definitions in IMC section 202:

(a) "Approved" means acceptable to the department.

(b) "Approval agency" means the department or its authorized representative.

(c) "Unusually tight construction" has the meaning given in s. Comm 65.0201.

**Note:** Section Comm 65.0201 reads: "Unusually tight construction" means the total area of outdoor openings is less than 3% of the floor area of the space in which equipment is located.

**Comm 64.0301 General regulations.** (1) ENERGY UTILIZATION. This is a department informational note to be used under IMC section 301.2:

**Note:** See ch. Comm 63 for additional requirements.

(2) LISTED AND LABELED. Substitute the following wording for the requirements in IMC section 301.4:

(a) *General.* All appliances regulated by this chapter shall be listed and labeled as specified in this chapter, unless otherwise approved by the department in accordance with par. (b).

(b) *Unlisted equipment.* If the equipment is unlisted, the one of the following provisions shall be taken:

1. A statement from the equipment manufacturer shall be provided indicating the national standard with which the equipment complies. A test by a Wisconsin registered engineer shall be conducted on the output and safety controls, in accordance with the national standard used by the manufacturer. A statement regarding the test of the rating and safety controls shall be furnished for each installation unless an approval for the equipment is obtained from the department.

**Note:** The purpose of the statement is to show that the equipment is in complete compliance with the national standard by which the equipment is designed, constructed and tested.

2. Approvals for unlisted equipment and products regulated by this chapter shall be as specified in ch. Comm 61.

(3) ELECTRICAL. Substitute the following wording for the requirements in IMC section 301.7: Electrical wiring, controls and connections to equipment and appliances regulated by this chapter shall be in accordance with ch. Comm 16.

(4) PLUMBING CONNECTIONS. Substitute the following wording for the requirements in IMC section 301.8: Potable water supply and building drainage system connections to equipment and appliances regulated by this chapter shall be in accordance with chs. Comm 81-87.

**Comm 64.0304 Installation.** This is a department informational note to be used under IMC section 304.2:

**Note:** See s. Comm 61.03 (2) for clarification on the application of different requirements and where the most restrictive requirements apply.

**Comm 64.0306 Access and service space.** This is a department exception to the requirements in IMC section 306.6: These provisions do not apply when the installation consists of fans only.

**Comm 64.0309 Temperature control.** Substitute the following wording for the requirements and exception in IMC section 309:

(1) HEATING SYSTEM DESIGN. Except as provided in subds. (2) or (3), the heating system shall be designed to maintain a temperature of not less than that shown in Table 64.0403 at 3 feet above the floor within the occupied space.

(2) SPOT HEATING. Spot heating may be used to heat individual fixed work stations in industrial buildings in lieu of heating the entire space as specified in sub. (1), provided the inside design temperature at the fixed work station is at least 60°F.

(3) SEASONAL OCCUPANCIES. When approved by the department, heating requirements may be waived, but not ventilation required by this chapter, during the period of May 15 through September 15 for the following or similar occupancies: drive-in eating places, club houses, outdoor toilets, camp lodge buildings, canning factories and migrant labor camps.

**Comm 64.0312 Heating and cooling load calculations.** This is a department informational note to be used under IMC section 312:

**Note:** For design parameters in the IECC refer to ch. Comm 63 or IECC section 803.

**Comm 64.0313 Other requirements.** These are department rules in addition to the requirements in IMC chapter 3:

(1) BALANCING, FINAL TEST REQUIRED. Every heating ventilating and air conditioning system shall be balanced upon installation. The person or agency responsible for balancing of the ventilating system shall document in writing the amount of outdoor air being provided and distributed for the building occupants and any other specialty ventilation. The document shall be retained at the site and shall be made available to the department upon request.

(a) Air systems shall be balanced in a manner to minimize losses from damper throttling by first adjusting fan speed then adjusting dampers to meet design flow conditions. Balancing procedures shall be acceptable to the department. Damper throttling alone may be used for air system balancing with fan motors of 1 hp or less, or if throttling results in no greater than 1/3 hp fan horsepower draw above that required if the fan speed were adjusted.

(b) Either of the following test methods shall be used:

1. Hydronic systems shall be balanced in a manner to minimize valve throttling losses by first trimming the pump impeller or adjusting the pump speed then adjusting the valves to meet design flow conditions.

2. Valve throttling alone may be used for hydronic system balancing under any of the following conditions as specified in subds. 3.a. to d.

- a. Pumps with pump motors of 10 hp or less.
- b. If throttling results in no greater than 3 hp pump horsepower draw for pumps of 60 hp or less, or no greater than 5% of pump horsepower draw for pumps greater than 60 hp, above that required if the impeller were trimmed.
- c. To reserve additional pump pressure capability in open circuit piping systems subject to fouling. Valve throttling pressure drop shall not exceed that expected for future fouling.
- d. Where it can be shown that throttling will not increase overall building energy costs.

**Note:** National Environmental Balancing Bureau (NEBB) Procedural Standards, the Associated Air Balance Council (AABC) National Standards, the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), or equivalent balancing procedures are acceptable to the department.

**(2) BALANCING, PROPER WORKING CONDITION.** HVAC control systems shall be tested to assure that control elements are calibrated, adjusted and in proper working condition.

**(3) BALANCING, OPERATING AND MAINTENANCE MANUAL.** An operating and maintenance manual shall be provided to the building owner or operator. The manual shall include basic data relating to the operation and maintenance of HVAC systems and equipment. Required routine maintenance actions shall be clearly identified. Where applicable, HVAC controls information such as diagrams, schematics, control sequence descriptions, and maintenance and calibration information shall be included.

**Comm 64.0401 Ventilation. (1) VENTILATION REQUIRED.** Substitute the following wording for the requirements in IMC section 401.2: Every occupied space shall be ventilated by natural means in accordance with IMC section 402 or by mechanical means in accordance with IMC section 403 and as specified in Table 64.0403.

**(2) WHEN REQUIRED.** Substitute the following wording for the requirements in IMC section 401.3:

(a) *Outside air.* Mechanical ventilation systems shall be operated to provide a continuous source of outside air to all areas while people are present.

(b) *Operation.* 1. Except as provided in subd. 2., the required building exhaust ventilating systems shall operate continuously when people are in the building to provide the amount of exhaust specified in Table 64.0403.

**Note:** Chapter Comm 32 may require continuous operation of some exhaust systems, such as purging systems, chloride storage exhaust or industrial exhaust.

2. Subdivision 1. does not apply to all of the following:

a. Toilet rooms with 2 or fewer total water closets or urinals, if the required ventilation is provided when the room is occupied.

b. Shower rooms with 2 or fewer showerheads if the required ventilation is provided when the room is occupied.

c. Common residential laundry rooms with a total of 4 or fewer washers and dryers if the required ventilation is provided when the room is occupied.

d. Mechanical exhaust systems for natatoriums even when the building is not occupied.

**(3) EXITS.** Substitute the following wording for the requirements in IMC section 401.4: Vestibule ventilation for smokeproof enclosures shall be in accordance with the IBC.

**(4) INTAKE OPENINGS.** (a) These are department rules in addition to the requirements in IMC section 401.5.1:

1. Mechanical and required gravity outside air intake openings shall be located a minimum of 10 feet from any hazardous or noxious contaminant such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this chapter. Where a source of contaminant is located within 10 feet of an intake opening, such opening shall be located a minimum of 2 feet below the contaminant source.

2. The lowest side of outside air intake required openings shall be located at least 12 inches vertically from the adjoining grade level, above adjoining roof surfaces, or above the bottom of an areaway.

3. Outside air intakes located in areaways shall be provided the minimum horizontal cross section of the areaway is equal to the free area of the opening.

(b) These are department exceptions in addition to the requirements in IMC section 401.5.1:

1. The setback distances as specified in IMC section 401.5.1 shall not apply to the combustion air intake of a direct vent appliance.

2. Unless a greater distance is specified by the manufacturer, exhaust openings of 100 cfm or less shall be located at least 12 inches, measured in any direction, from doors or openable windows.

3. The 10-foot minimum separation does not apply to the intake and exhaust of a factory - packaged rooftop unit or other listed outdoor appliance provided nothing restricts air flow around the unit. The exhaust and intake of the unit shall be located to minimize contamination of outside air.

4. Unless a greater distance is specified by the manufacturer, product of combustion outlets of direct vent appliance vents shall terminate at least 12 inches measured in any direction from doors or openable windows.

**Note:** See ch. Comm 82 for plumbing vent setbacks. That rule requires plumbing vents to be 10 feet from air intakes and 10 feet horizontally from or 2 feet above roof scuttles, doors or openable windows.

**Note:** See NFPA standard 45, Fire Protection for Laboratories Using Chemicals, adopted under ch. Comm 10, for chemical fume hood exhaust location. Health care and related facilities may have additional requirements.

**(5) EXHAUST OPENINGS.** These are department rules in addition to the requirements in IMC section 401.5.2:

(a) *Gravity ventilation ducts.* Gravity ventilation ducts shall extend not less than 2 feet above the highest portion of the building within a 10-foot radius of the duct and shall be provided with a siphon roof ventilator.

(b) *Barometric relief vents.* Where barometric relief vents are installed on the roof, the discharge openings shall be no less than 2 feet above the roof surface where the vent pierces the roof.

**Comm 64.0402 Natural ventilation.** This is a department rule in addition to the requirements in IMC section 402: Natural ventilation shall be permitted only in areas specified in Table 64.0403.

**Comm 64.0403 Mechanical ventilation. (1) VENTILATION SYSTEMS.** Substitute the following wording for the requirements in IMC section 403.1:

(a) Mechanical ventilation shall be provided by a method of supply air and exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with IMC chapter 6.

(b) Ventilation supply systems shall be designed to deliver the required rate of supply air into the occupied zone within an occupied space.

**(2) OUTDOOR AIR REQUIRED.** (a) This is a department exception to the requirements in IMC section 403.2: Where it can be demonstrated that an engineered ventilation system design will

prevent the maximum concentration of contaminants from exceeding the maximum obtainable by providing the rate of outdoor air ventilation determined in accordance with IMC section 403.3, the minimum required rate of outdoor air may be reduced in accordance with such engineered system design.

(b) This is a department rule in addition to the requirements in IMC section 403.2: The outdoor air shall be free from contamination of any kind in proportions detrimental to the health and comfort of the general population exposed to it.

**(3) RECIRCULATION OF AIR.** This is a department informational note to be used under IMC section 403.2.1:

**Note:** The following are examples where the department will accept air transferred from: corridor to toilet room; corridor to cloak room or janitor closet; dining room to kitchen; locker room to toilet room; gymnasium to locker room; showroom to garage; and corridor to school vocational shops.

**(4) VENTILATION RATE.** (a) This is a department rule in addition to the requirements in IMC section 403.3:

1. 'Toilet rooms.' A toilet room that has only one water closet or urinal and no bathtub or shower shall be provided with either natural ventilation via a window or louvered opening with at least 2 square feet of area openable directly to the outside or mechanical exhaust ventilation as specified in Table 64.0403.

2. 'Janitor closets.' A janitor closet that has only one service sink shall be provided with either natural ventilation via a window or louvered opening with at least 2 square feet of area openable directly to the outside or mechanical exhaust ventilation as specified in Table 64.0403.

3. 'Locker and shower rooms.' An adjoining locker, shower and toilet room shall be exhausted at the rate specified in Table 64.0403 based on the largest amount of exhaust required for any of the three rooms. A negative pressure relationship shall be maintained in the shower and toilet rooms with respect to the locker room.

4. 'Chemical or septic toilets.' Chemical or septic toilets and composting privies are prohibited in spaces under negative pressure. Toilet rooms with chemical or septic toilets shall be provided with natural ventilation via a window, louver or skylight with at least 2 square feet of area openable directly to the outside. The opening shall be provided with a screen to limit the passage of insects and vermin.

5. 'Pool ventilation.' In a natatorium, the volume of supply air and exhaust air may be reduced to a minimum of 1 cfm per square foot of pool surface provided automatic humidity controls perform so as not to create accelerated building material deterioration from moisture condensation.

(b) Substitute the following wording for the requirements and exceptions in IMC section 403.3:

1. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with Table 64.0403 based on the occupancy of the space, the occupant load and a minimum of 7.5 cfm of outside air per person, or other parameters stated therein.

2. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 64.0403.

3. Where there is no value indicated for the net square feet per person in Table 64.0403, the actual number of occupants shall be used to determine the required amount of outside air.

4. Ventilation rates for occupancies not represented in Table 64.0403 shall be determined by an approved engineering analysis, or by using the most similar occupancy in the table.

5. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of this chapter.

**Note:** See Table 64.0403 for specific occupancies.

(c) This is an additional department exception to the requirements in IMC section 403.3: The estimated maximum occupant load rate may be determined using other means with justification acceptable to the department to show that a different number of occupants is reasonable.

(d) This is a department rule in addition to the requirements in IMC section 403.3:

1. Except as provided in subd. 2., spaces requiring different ventilation requirements shall be provided with a complete solid separation or the most stringent ventilation requirement shall apply to all unseparated areas.

2. The separation as specified in subd. 1. shall not be required where an engineered ventilation design system will prevent the concentration of contaminants from exceeding that obtainable by providing a physical separation.

(e) This is a department rule in addition to the requirements in IMC section 403.3:

1. 'Outside air requirement waived'. If a mechanical air supply system is provided and the requirement for outdoor air determined in accordance with Table 64.0403 is less than 5% of the minimum required air changes per hour, the requirement for outside air may be eliminated.

2. 'Outside air requirement and percent of openings waived.' The requirement for outside air or percent of openings specified in Table 64.0403 may be omitted in large volume spaces containing 5,000 or more cubic feet per occupant. Required exhaust ventilation and makeup air shall not be omitted.

(5) COMMON VENTILATION SYSTEM. These are department alternatives to the requirements in IMC section 403.3.2:

(a) *General.* Each room served by a mechanical ventilation system shall be provided with the minimum outdoor airflow rate determined individually for each room, or the minimum amount of outside air may be supplied to the system if a minimum air change rate is provided in accordance with this subsection or waived in accordance with par. (c).

(b) *Minimum air change.* 1. 'Application.' a. Required air change shall be provided while people are present.

b. The air-change rate may be based on actual room height or up to 10 feet from the floor level of the room in question. The volume above 10 feet, in rooms that are more than 10 feet in height, need not be considered in the air change requirement if the required air change is designed to occur in the lower 10 feet of the occupied space.

c. The required minimum air change volume shall be transferred through the air handling equipment where it is diluted or replaced with outside air, and supplied back to the space.

2. 'Six air changes per hour.' Except as specified in subd. 3 and unless mechanical exhaust is required by Table 64.0403, the total air change rate for each room shall be at least 6 air changes per hour.

3. 'Less than six air changes per hour.' An air change rate of less than 6 air changes per hour will be permitted where mechanical cooling (air conditioning) is provided to maintain an interior design temperature of 78°F or lower and the heat gain requirement for the space has been satisfied. The air change rate may not be less than the minimum air changes per hour if specified in Table 64.0403.

**Note:** As specified in s. Comm 64.0403, the amount of outside air required must be maintained even if the air change rate is reduced.

(c) *Air change requirement waived.* The air change requirement for 6 air changes per hour may be omitted in any of the following applications:

1. Spot heating

2. Buildings where the requirement for outside air is waived in accordance with sub. (4) (e).

3. Buildings utilizing natural ventilation as specified in IMC section 402.

**(6) REQUIRED OUTDOOR VENTILATION AIR.** (a) Substitute the following table for IMC Table 403.3:

**Table 64.0403**  
**Required Minimum Inside Temperature**  
**And Outdoor Ventilation Air**

Occupancy Classification <sup>i</sup>	Minimum Inside Temperature  (degrees F)	Estimated Maximum Occupant Load  (persons per 1,000 sq. ft.) <sup>a</sup>	Ventilation Requirements Basis of Capacity		Air Change Rate <sup>k</sup>  (minimum air change per hour with A/C)
			Natural Ventilation Allowed	Exhaust <sup>e</sup>  (cfm/net sq. ft. floor area)	
<u>Correctional facilities</u>					
Sleeping rooms <sup>j</sup>	68	20	yes	---	---
Dining halls	68	100	no	---	2.0
Guard stations	68	40	yes	---	---
<u>Dry cleaners, laundries</u>					
Coin-operated dry cleaners	68	8	yes	---	1.0
Coin-operated laundries	68	8	yes	---	1.0
Commercial dry cleaner	60	---	no	2.00	---
Commercial laundries	60	---	no	2.00	---
Storage, pick up	60	8	yes	---	1.0
Apartment laundry rooms	60	---	no	0.5	---
<u>Education</u>					
Auditoriums	68	150	no	---	2.0
Classrooms	68	50	no	---	2.0
Day care facilities	68	30	yes only if ≤ 20 children	---	2.0
Laboratories (science)	68	30	no	---	2.0
Corridors with lockers	68	---	---	---	10 cfm/lineal ft. of length
Music rooms	68	50	no	---	2.0
Smoking lounges <sup>b,g</sup>	68	---	no	2.00	---
Special education	68	35	no	---	2.0
Training shops	60	30	no	---	---
<u>Food and beverage service</u>					
Bars and cocktail lounges	68	100	no	---	2.0
Cafeterias, fast food	68	100	no	---	2.0
Dining rooms	68	70	no	---	2.0

**Table 64.0403  
Required Minimum Inside Temperature  
And Outdoor Ventilation Air**

Occupancy Classification <sup>i</sup>	Ventilation Requirements Basis of Capacity				
	Minimum Inside Temperature  (degrees F)	Estimated Maximum Occupant Load  (persons per 1,000 sq. ft.) <sup>a</sup>	Natural Ventilation Allowed	Exhaust <sup>e</sup>  (cfm/net sq. ft. floor area)	Air Change Rate <sup>k</sup>  (minimum air change per hour with A/C)
Kitchens (cooking) <sup>f,g</sup>	60	20	yes	---	1.0
<u>Health care facilities</u>	footnote m	footnote m	footnote m	footnote m	footnote m
Hospitals					
Nursing homes					
Ambulatory surgery centers					
<u>Hotels, motels, resorts and dorms</u>					
Assembly rooms	68	120	no	---	2.0
Bathrooms <sup>b,g</sup>	68	---	no	35 cfm/room	---
Bedrooms	68	footnote n	yes	---	---
Conference rooms	68	50	no	---	2.0
Dormitory sleeping areas	68	20	yes	---	---
Casinos	68	---	no	2.00	---
Living rooms	68	footnote n	yes	---	---
Lobbies	68	30	no	---	---
<u>Industrial/Factory</u>					
Factories and machine shops	60	13	yes	---	---
Foundries	NMR	13	yes	---	---
Sawmill	NMR	---	yes	---	---
<u>Offices</u>					
Conference rooms	68	50	no	---	1.5
Office spaces	68	7	no	---	1.5
Reception areas	68	60	no	---	1.5
Telecommunication centers and data entry	68	60	no	---	1.5

**Table 64.0403**  
**Required Minimum Inside Temperature**  
**And Outdoor Ventilation Air**

Occupancy Classification <sup>i</sup>	Minimum Inside Temperature (degrees F)	Estimated Maximum Occupant Load (persons per 1,000 sq. ft.) <sup>a</sup>	Ventilation Requirements Basis of Capacity		
			Natural Ventilation Allowed	Exhaust <sup>e</sup> (cfm/net sq. ft. floor area)	Air Change Rate <sup>k</sup> (minimum air change per hour with A/C)
<u>Places of worship, entertainment and recreation which accommodates less than 100 persons</u>	footnote h	---	yes	footnote h	---
<u>Private dwellings, single and multiple</u>					
Living areas	68	2 people for first bedroom plus one person for each additional bedroom	yes	---	---
Kitchens <sup>g</sup>	68	---	yes	100 cfm intermittent or 20 cfm continuous	---
Toilet rooms and bathrooms <sup>g, 1</sup>	68	---	no	Mechanical exhaust capacity 50 cfm intermittent or 20 cfm continuous	---
Garages, separated by a solid wall for each dwelling	NMR	---	yes	100 cfm/vehicle	---

**Table 64.0403**  
**Required Minimum Inside Temperature**  
**And Outdoor Ventilation Air**

Occupancy Classification <sup>i</sup>	Minimum Inside Temperature  (degrees F)	Estimated Maximum Occupant Load  (persons per 1,000 sq. ft.) <sup>a</sup>	Ventilation Requirements Basis of Capacity		
			Natural Ventilation Allowed	Exhaust <sup>e</sup>  (cfm/net sq. ft. floor area)	Air Change Rate <sup>k</sup>  (minimum air change per hour with A/C)
Garages, common for multiple units <sup>b</sup>	NMR	---	no	0.5	---
<u>Retail stores, sales floors and showroom floors</u>	68	8	yes	---	1.0
<u>Seasonal occupancies, camps and lodges</u>					
Dining and recreational areas	NMR	15	yes	---	---
Living and sleeping areas	NMR	---	yes	---	---
Club houses	NMR	15	yes	---	---
Drive-ins	NMR	15	yes	---	---
<u>Specialty shops</u>					
Automotive service and repair garages	60	---	no	0.5	---
Barber shops	68	25	no	---	---
Beauty salons <sup>c</sup>	68	---	no	0.5	---
Clothier, furniture specialty shops	68	8	yes	---	1.0
Florist shops	68	8	yes	---	1.0
Hardware, drugs, fabrics stores	68	8	yes	---	1.0
Supermarkets	68	8	yes	---	1.0
<u>Sports and amusement</u>					
Ballrooms and discos	68	100	no	---	2.0

**Table 64.0403  
Required Minimum Inside Temperature  
And Outdoor Ventilation Air**

Occupancy Classification <sup>i</sup>	Minimum Inside Temperature  (degrees F)	Estimated Maximum Occupant Load  (persons per 1,000 sq. ft.) <sup>a</sup>	Ventilation Requirements Basis of Capacity		
			Natural Ventilation Allowed	Exhaust <sup>e</sup>  (cfm/net sq. ft. floor area)	Air Change Rate <sup>k</sup>  (minimum air change per hour with A/C)
Bleacher areas	68	363 or 18 in./person	no	---	2.0
Bowling centers (seating areas)	68	70	no	---	2.0
Game rooms	68	70	no	---	2.0
Natoriums	76	---	---	2.0 cfm/ sq. ft. pool area	---
Ice skating rinks (indoor)	NMR	5	no	---	---
Playing floor (gymnasiums)	68	30	no	---	2.0
Roller skating rinks (indoor)	60	30	no	---	2.0
Spectator areas (non- bleacher)	68	150	no	---	2.0
<u>Storage</u>					
Chlorine storage and handling rooms	NMR	---	no	2.00	---
Enclosed parking garages <sup>d</sup>	NMR	---	no	0.50	---
Warehouses	NMR	---	---	---	---
<u>Theaters</u>					
Auditoriums	68	150	no	---	2.0
Lobbies	68	150	no	---	---
Stages, studios	68	70	no	---	2.0
Ticket booths	68	60	no	---	2.0
<u>Transportation</u>					
Platforms	NMR	100	no	---	2.0
Waiting rooms	68	100	no	---	2.0
<u>Utility and public spaces</u>					
Elevators <sup>g</sup>	NMR	---	no	1.00	---

**Table 64.0403  
Required Minimum Inside Temperature  
And Outdoor Ventilation Air**

Occupancy Classification <sup>i</sup>	Minimum Inside Temperature  (degrees F)	Estimated Maximum Occupant Load  (persons per 1,000 sq. ft.) <sup>a</sup>	Ventilation Requirements Basis of Capacity		
			Natural Ventilation Allowed	Exhaust <sup>e</sup>  (cfm/net sq. ft. floor area)	Air Change Rate <sup>k</sup>  (minimum air change per hour with A/C)
Janitor closets <sup>l</sup>	NMR	---	no	2.0 or 75 cfm/sink	---
Locker and dressing rooms <sup>b</sup>	70	---	no	0.5	---
Shower rooms	70	---	no	2.00	---
Toilet rooms <sup>b, g, l</sup>	68	---	no	75 cfm/TF	---
Smoking lounges <sup>b, g</sup>	68	---	no	2.00	---
<u>Workrooms</u>					
Bank vault	68	5	no	---	---
Meat processing workroom	NMR	10	yes	---	---
Pharmacy	68	20	yes	---	1.5
Photo studio	68	10	yes	---	1.0
Printing	60	13	yes	footnote <sup>o</sup>	---

CFM = Cubic feet per minute; LF = Lineal foot; NMR = No minimum requirement; TF = Toilet fixtures (water closets and urinals); A/C = Air conditioning

<sup>a</sup> Based upon net floor area.

<sup>b</sup> Mechanical exhaust is required and the recirculation of air from these spaces that would otherwise be allowed by IMC section 403.2.1 is prohibited.

<sup>c</sup> The classification of a 'beauty' shop depends on the types of services provided. Only beauty salons routinely provide chemical processing of hair to produce texture or color changes, or manicures or other services with a similar need for air-borne contaminant and odor control.

<sup>d</sup> Enclosed parking garages are parking garages with less than 30% open areas in the total wall area enclosing the garage. Ventilation systems in enclosed parking garages shall comply with IMC section 404. A mechanical ventilation system shall not be required in garages having a floor area of 850 square feet or less and used for the storage of 5 or fewer motorized vehicles. Requirements for parking garages shall apply to all buildings, or parts of buildings, into which motor vehicles are driven for loading or unloading or are stored.

<sup>e</sup> The ventilation rate is based upon cubic feet per minute per square foot of the floor area being ventilated.

<sup>f</sup> The sum of the outdoor and transfer air from adjacent spaces shall be sufficient to provide an exhaust rate of not less than 1.5 cfm/sf.

<sup>g</sup> Transfer air permitted in accordance with IMC section 403.2.2.

<sup>h</sup> See specific occupancy classification table entries for inside design temperature and cfm per net square feet floor area requirements.

<sup>i</sup> This table is intended as a reference guide with generic Use types listed under those Occupancy types most often associated with the use. When Use types are mixed between Occupancy types and the Use type is unlisted within the specific Occupancy type, the use shall be ventilated as required by the same Use type listed in the other Occupancy type. Unlisted occupancies or uses shall be ventilated as required for the most similar listed occupancy classification acceptable to the department. Rooms that are used for different purposes at different times shall be designed for the greatest amount of ventilation required for any of the uses.

<sup>j</sup> When unseparated toilet fixtures are included in sleeping areas (such as cells), the room shall be ventilated as required for toilet rooms.

<sup>k</sup> See sub. (5) for specific requirements and exceptions. Units listed as minimum air change per hour with air conditioning unless otherwise specified.

<sup>l</sup> Natural ventilation may be allowed under this section.

<sup>m</sup> For air ventilation requirements in healthcare facilities; use American Institute of Architects (AIA) guidelines, (R673, Guidelines for Design and Construction of Hospital and Health Care Facilities).

<sup>n</sup> The minimum mechanical ventilation rate is 15 cfm/room of outside air.

<sup>o</sup> Refer to IMC chapter 5 for requirements.

**Comm 64.0404 Enclosed parking garages. (1) ENCLOSED PARKING GARAGES. (a)**  
These are department rules in addition to the requirements in IMC section 404.1:

1. Operate the exhaust for a minimum of 5 hours per day.
2. Maintain 1 ppm NO<sub>2</sub> or less where diesel fuel vehicles are stored.
3. Maintain negative or neutral pressure relative to other spaces.

(b) Substitute the following wording for the requirements in IMC section 404.1: Mechanical ventilation systems for enclosed parking garages are not required to operate continuously where the system is arranged to operate automatically upon detection of carbon monoxide of 35 parts per million (ppm) by approved automatic detection devices.

**(2) MINIMUM VENTILATION.** Substitute the following wording for the requirements in IMC section 404.2: Automatic operation of the system shall not reduce the ventilation rate below 7.5 cfm per person and the system shall be capable of producing an exhaust rate of 0.5 cfm per square foot of floor area.

**Comm 64.0501 Required systems.** This is a department exception to the requirements in IMC section 501.4: A mechanically exhausted room or space that is within a dwelling unit which is served by an independent heating, ventilating and air conditioning system is not required to be maintained with negative or neutral pressure.

**Comm 64.0502 Required systems.** Substitute the following wording for the requirements in IMC section 502.1: An exhaust system shall be provided, maintained and operated as specifically required by this section and for all occupied areas where machines, vats, tanks, furnaces, forges, salamanders and other appliances, equipment and processes in such areas produce or throw off dust particles sufficiently light to float in the air or which emit heat, odors, fumes, spray, gas or smoke, in such quantities to be injurious to health or safety.

**Comm 64.0506 Commercial kitchen grease ducts and exhaust equipment. (1)**  
GENERAL. This is an informational note to be used under IMC section 506.1:

**Note:** See Table 64.0403 for modifications in regarding required cfm/person.

(2) EXHAUST FANS. (a) This is a department alternative to the requirements, but not the exceptions, in IMC section 506.3.3: Joints may be made with any other means that provide a liquid-tight seal at 1500°F.

(b) Substitute the following wording for the requirements in IMC section 506.3.3.1:

1. Duct joints shall be butt joints or overlapping duct joints of either the telescoping bell type or flanged. Overlapping joints shall be installed to prevent ledges and obstructions from collecting grease or interfering with gravity drainage to the intended collection point.

2. The difference between the inside cross-sectional; dimensions of overlapping sections of duct shall not exceed 0.25 inch.

3. The length of overlap for overlapping duct joints shall not exceed 2 inches.

(c) This is a department rule in addition to the requirements in IMC section 506.3.8: Fans serving commercial kitchen hoods shall be listed for use with grease-laden air.

**Comm 64.0507 Capacity of hoods.** Substitute the following wording for the requirements in IMC section 507.13: The kitchen exhaust hood shall be provided with a capture velocity to effectively capture the grease vapors and may be designed through engineering analysis, or based this section and the requirements in IMC sections 507.13.1 through 507.13.4.

**Comm 64.0603 Duct construction and insulation.** This is a department informational note to be used under IMC sections 603.3 and 603.4:

**Note:** For DHFS licensed healthcare facilities as specified in chs. HFS 124, 131, 132, and 134, also refer to the following standards: Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), HVAC Duct Construction Standards-- Metal and Flexible, 1995 edition.

**Comm 64.0604 Insulation.** This is a department exception to the requirements in IMC section 604.8: The distances from a listed duct lining to a heater may be reduced in accordance with the duct lining listing.

**Comm 64.0605 General.** These are department exceptions to the requirements in IMC section 605.1:

(1) Hospitals, nursing homes and ambulatory surgery centers shall comply with the filtration requirements in Tables 2 and 6, part III of the AIA Guidelines for Design and Construction of Hospitals and Health Care Facilities.

(2) Preheat coils for snow melting that are single row, have a maximum 8 fins per inch, are accessible for pressure washing and have ductwork that is designed for drainage need not be provided with air filters.

**Comm 64.0606 Smoke detection system control.** (1) This is a department informational note to be used under IMC section 606.2.1:

**Note:** For DHFS licensed healthcare facilities as specified in chs. HFS 124, 131, 132, and 134, also refer to NFPA standard 90A section 4-4.2A for air handling units between 2,000 cfm and 15,000 cfm.

(2) This is a department informational note to be used under IMC section 606.4:

**Note:** For DHFS licensed healthcare facilities as specified in chs. HFS 124, 131, 132, and 134, also refer to NFPA standard 90A section 4-3.2 for smoke dampers isolating air handling units.

**Comm 64.0702 Inside air.** (1) This is a department rule in addition to the requirements in IMC section 702.1: When the space providing air for combustion, ventilation and dilution of flue gases has a minimum volume of 250 cubic feet per 1,000 Btu per hour combined input rating of all appliances, the use of inside air for combustion shall be allowed.

(2) This is a department informational note to be used under IMC section 702.1:

**Note:** When applying the provisions of this section, refer to IFGC section 201 as adopted and modified in s. Comm 65.0210 for the definition of "unusually tight construction".

**Comm 64.0710 Opening location and protection.** Substitute the following wording for the requirements in IMC section 710.1: Mounting height of the combustion air intakes shall have the lowest side of outside air intake openings located at least 12 inches vertical from the adjoining grade level.

**Comm 64.0801 (1) GENERAL.** This is a department informational note to be used under IMC chapter 8:

**Note:** For DHFS licensed healthcare facilities as specified in chs. HFS 124, 132, and 134, also refer to NFPA 211 as adopted in these chapters.

(2) CHIMNEYS AND VENTS. These are department rules in addition to the requirements in IMC section 801.2: Permanently installed and portable unvented fuel-fired space heaters are prohibited.

**Note:** See ch. Comm 65, subch. II, Part 6 for the prohibition of unvented gas-fired space heaters.

**Comm 64.0918 Forced-air warm-air furnaces.** (1) This is a department rule in addition to the requirements in IMC section 918.6: The outside air intake openings shall be located at least 12 inches vertical from the adjoining grade level.

(2) Substitute the following wording for the requirements IMC section 918.6 item 1: Closer than 10 feet from any appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 2 feet above the outside air inlet.

(3) Substitute the following wording for the requirements in IMC section 918.6 item 2: Where located less than 10 feet above the surface of any abutting public way or driveway, or at grade level by a sidewalk, street, alley or driveway.

**Comm 64.1001 Boilers, water heaters and pressure vessels.** Substitute the following wording for the requirements and exceptions in IMC chapter 10:

(1) The provisions of ch. Comm 41 shall govern the installation, alteration and repair of boilers and pressure vessels. The provisions of chapters Comm 81 to 86 shall govern the installation, alteration and repair of water heaters.

(2) Water heaters utilized both to supply potable hot water and provide hot water for space-heating applications shall be listed and labeled by the manufacturer and shall be installed in accordance with the manufacturer's installation instructions and applicable provisions in chs. Comm 81 to 86.

(3) Water heaters utilized for both potable water heating and space-heating applications shall be sized to prevent the space-heating load from diminishing the required water-heating capacity.

(4) Where a combination potable water-heating and space-heating system requires water for space heating at temperatures higher than 140°F, a tempering valve shall be provided to temper the water supplied to the potable hot water distribution system to a temperature of 140°F or less.

**Comm 64.1101 Refrigeration.** Substitute the following wording for the requirements and exceptions in IMC chapter 11: Mechanical refrigerating systems installed in public buildings and places of employment shall comply with ch. Comm 45.

**Comm 64.1201 Hydronic piping.** Substitute the following wording for the requirements and exceptions in IMC Chapter 12: The provisions of ch. Comm 41 shall apply to boilers, piping components associated with boilers, pressure vessels and power piping in places of employment and in public buildings.

**Comm 64.1300 Fuel oil piping and storage.** Substitute this informational note for the requirements in IMC chapter 13:

**Note:** See ch. Comm 10 for fuel oil piping requirements.

**Comm 64.1500 Referenced standards.** (1) Substitute the following NFPA standard for the corresponding standard listed in IMC chapter 15: NFPA 13-1999 and NFPA 72-1999.

(2) These are department rules in addition to the requirements in IMC chapter 15: American Institute of Architects (AIA), R673-1996-97, Guidelines for Design and Construction of Hospital and Health Care Facilities, The American Institute of Architects, Order Department, 9 Jay Gould Court, P.O. Box 753, Waldorf, MD 20601

**Note:** Copies of the adopted standards are on file in the offices of the department, the secretary of state and the revisor of statutes. Copies may be purchased through the respective organizations as listed in the IMC.

**Note:** The tables in this section provide a comprehensive listing of all of the standards adopted by reference in this chapter. For requirements or limitations in how these standards are to be applied, refer to the code section that requires compliance with the standard.

**Comm 64.1600 Appendices.** IMC Appendices A and B are not included as part of this chapter.

*File reference: Comm 64C 1r*