Chapter Comm 64

HEATING, VENTILATING AND AIR CONDITIONING

Subchapter I — Scope
Comm 64.0001 Scope.

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).
Comm 64.0101 Administration.
Comm 64.0102 Applicability.
Comm 64.0202 Definitions.
Comm 64.0300 Health care facilities.
Comm 64.0301 General regulations.
Comm 64.0304 Installation.
Comm 64.0306 Access and service space.
Comm 64.0309 Temperature control.
Comm 64.0312 Heating and cooling load calculations.
Comm 64.0313 Other requirements.
Comm 64.0401 Ventilation.
Comm 64.0402 Natural ventilation.
Comm 64.0403 Mechanical ventilation.
Comm 64.0404 Minimum enclosed garage ventilation.
Comm 64.0501 General.
Comm 64.0502 Required systems.
Comm 64.0506 Commercial kitchen grease ducts and exhaust equipment.
Comm 64.0507 Commercial kitchen hoods.
Comm 64.0513 Smoke control systems.
Comm 64.0514 Energy recovery ventilation systems.
Comm 64.0601 General.
Comm 64.0602 Plenums.
Comm 64.0606 Smoke detection system control.
Comm 64.0607 Ducts and air−transfer openings.
Comm 64.0702 Inside air.
Comm 64.0710 Opening location and protection.
Comm 64.0801 Chimneys and vents.
Comm 64.0918 Forced−air warm−air furnaces.
Comm 64.1001 Boilers, water heaters and pressure vessels.
Comm 64.1101 Refrigeration.
Comm 64.1500 Referenced standards.
Comm 64.1600 Appendices.

Note: Chapter Comm 64 as it existed on June 30, 2002 was repealed and a new chapter Comm 64 was created, Register December 2001 No. 552, effective July 1, 2002.

Note: Chapter ILHR 64 was renumbered to be Chapter Comm 64 under s. 13.93 (2m) (b) 1., Stats., and corrections made under s. 13.93 (2m) (b) 7., Stats., Register, September, 1998, No. 513.

Note: Chapter ILHR 64 was revised in December, 1995 effective April 1, 1996. On April 6, 1996 the department of industry, labor and human relations published an emergency rule stating that the effective date of the December, 1995 rule version was delayed. A permanent rule was adopted in December, 1996 stating that the revised text of ch. ILHR 64, as published, would be effective April 1, 1997.

Note: Chapter Ind 59 as it existed on December 31, 1975 was repealed and a new chapter Ind 64 was created effective January 1, 1976. Chapter Ind 64 was renumbered to be chapter Comm 64 effective January 1, 1984. Chapter ILHR 64 as it existed on March 31, 1997 was repealed and a new chapter ILHR 64 was created effective April 1, 1997. Corrections made under s. 13.93 (2m) (b) 1. and 7., Stats., Register, March, 1997, No. 495.

Subchapter I — Scope

Comm 64.0001 Scope. This chapter shall regulate the design, installation, maintenance, alteration and inspection of mechanical systems that provide control of environmental conditions and related processes within buildings. This chapter shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed herein. The use 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.

History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02; **CR 06−120: r. and recr. Register February 2008 No. 626, eff. 3−1−08**.

Comm 64.0002 Application. History:CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02**; CR 06−120: r. Register February 2008 No. 626, eff. 3−1−08**

Comm 64.0003 Compliance. History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02**; CR 06−120: r. Register February 2008 No. 626, eff. 3−1−08.**

Comm 64.0004 Approval of drawings and specifications. History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02; **CR 06−120: r. Register February 2008 No. 626, eff. 3−1−08.**

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 omissions to the IMC are specified in this subchapter and are rules of the department and are not requirements of the IMC.

Note: The sections in this subchapter are generally numbered to correspond with the section numbering in the IMC; e.g., s. Comm 64.0102 corresponds to IMC section 102.

History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02; CR 04−016: am. Register December 2004 No. 588, eff. 1−1−05.

Comm 64.0101 Administration. Except for IMC section 102.8, the requirements in IMC chapter 1 are not included as part of this chapter.

History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02; CR 04−016: renum. (1) (a), (b) and (2) to be Comm 64.0101, 64.0102 (1) and 64.0103 Register December 2004 No. 588, eff. 1−1−05; **CR 06−120: r. and recr. Register February 2008 No. 626, eff. 3−1−08.**

Comm 64.0102 Applicability. (2) This is a department rule in addition to the requirements in IMC chapter 1:

(a) 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 heating, ventilating and air conditioning (HVAC) systems and equipment.

(b) 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.

History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02; CR 04−016: (1) renum. from Comm 64.0101 (1) (b), renum. (intro.), (1) and (2) to be (2) Register December 2004 No. 588, eff. 1−1−05; **CR 06−120: r. (1) Register February 2008 No. 626, eff. 3−1−08; correction in (2) (intro.) made under s. 13.92 (4) (b) 7., Stats., Register February 2008 No. 626.**

Comm 64.0103 Scope. History: CR 04−016: renum. from Comm 64.0101 (2) and am. Register December 2004 No. 588, eff. 1−1−05; **CR 06−120: r. Register February 2008 No. 626, eff. 3−1−08.**

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

(c) "DHS" means the department of health services.

(d) "Health care facility" means a hospital, nursing home, or ambulatory surgical center.

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

(a) "Approved" has the meaning given in s. Comm 62.0202 (2) (a).

History: CR 00−179: cr. Register December 2001 No. 552, eff. 7−1−02; CR 01−139: r. (2) (b), renum. (2) (c) to be (2) (b) Register June 2002 No. 558, eff. 7−1−02;

correction in (2) (b) made under s. 13.93 (2m) (b) 7., Stats., Register April 2003 No. 568; **CR 06–120: am. (1) (intro.), r. (1) (a), (b) and (2) (b), r. and recr. (1) (d), renum. (2) (a) to be (2) Register February 2008 No. 626, eff. 3–1–08; correction in (2) made under s. 13.92 (4) (b) 1., Stats., Register February 2008 No. 626; corrections in (1) (c) made under s. 13.92 (4) (b) 6., Stats.**

Comm 64.0300 Health care facilities. This is a department rule in addition to the requirements in IMC chapter 3: In addition to the requirements in this code, the heating and ventilation systems for health care facilities shall conform to the applicable provisions of the American Institute of Architects (AIA) Guidelines for Design and Construction of Health Care Facilities.

History: CR 06–120: cr. Register February 2008 No. 626, eff. 3–1–08.

Comm 64.0301 General regulations. (1) SCOPE. Substitute the following wording for the requirements in IMC section 301.1: This chapter shall govern the approval and installation of all equipment and appliances that comprise parts of the building mechanical systems regulated by this code in accordance with subch. 1.

(2) ENERGY UTILIZATION. This is a department informational note to be used under IMC section 301.2:

Note: See ch. Comm 63 for additional requirements.

(3) 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 approved by the department in accordance with par. (b) or the product approval criteria in s. Comm 61.50.

(b) *Unlisted appliances.* The department may approve an installation of an unlisted appliance after receipt of all of the following:

1. A statement from the appliance manufacturer indicating the national standard with which the appliance complies.

2. The results of a test conducted by a Wisconsin registered engineer on the output and safety controls in accordance with the national standard used by the manufacturer.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–139: r. and recr. (2) (a) and (b) Register June 2002 No. 558, eff. 7–1–02; CR 04–016: renum. (1) to (4) to be (2) to (5) and am. (3) (a), cr. (1) Register December 2004 No. 588, eff. 1–1–05; **CR 06–120: am. (3) (b), r. (4) and (5) Register February 2008 No. 626, eff. 3–1–08**.

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

Note: See s. Comm 61.03 (3) for clarification on the application of different requirements and where the most restrictive requirements apply.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

Comm 64.0306 Access and service space. This is a department exception to the requirements in IMC section 306.5.1: These provisions do not apply when the installation consists of fans only.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: am. Register February 2008 No. 626, eff. 3–1–08**.

Comm 64.0309 Temperature control. These are department exceptions to the requirements in IMC section 309.1:

(1) ALTERNATE MINIMUMS. For those interior spaces intended for human occupancy listed in Table 64.0309, the heating system shall be capable of maintaining an inside temperature of not less than that shown in the table at 3 feet above the floor.

Table 64.0309
Alternate Minimum Inside Temperature

Occupancy Types	Minimum Inside Temperature (degrees F)
Dry cleaners, laundries, laundry rooms	60
Educational training shops	60
Commercial kitchens	60
Health care facilities, hospitals, nursing homes, ambulatory surgery centers	Footnote a
Factories and machine shops	60
Foundries	NMR
Sawmills	NMR
Garages at private dwellings	NMR
Automotive service and repair garages	60
Car washes, enclosed:	NMR
Self–serve	60
All other types	
Ice skating rinks (indoor)	NMR
Natatoriums	76
Roller skating rinks (indoors)	60
Storage	NMR
Elevator cars	NMR
Janitor closets	NMR
Locker and dressing rooms	70
Shower rooms	70
Food processing	NMR
Printing	60

NMR = No minimum requirement

a For inside temperature requirements in health care facilities, use American Institute of Architects (AIA) Guidelines for Design and Construction of Hospital and Health Care Facilities.

(2) SEASONAL OCCUPANCIES. The heating requirements but not the ventilation requirements may be waived during the period of May 1 through October 15 for the following or similar occupancies: drive–in eating places, club houses, outdoor toilets, camp lodge buildings, canning factories and migrant labor camps.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–135: am. (1) Register June 2002 No. 558, eff. 7–1–02; **CR 06–120: r. and recr. Register February 2008 No. 626, eff. 3–1–08.**

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 503.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

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 subd. 2. 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 MANUALS. (a) The designer or installer shall provide the owner with written instructions for the operation and maintenance of the HVAC systems 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 heating, ventilating and air conditioning (HVAC) systems and equipment.

(b) 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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: r. and recr. (3) Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0401 Ventilation. (1) VENTILATION REQUIRED. This is department exception to the requirements of IMC section 401.2: Outdoor air ventilation by natural means or mechanical shall be permitted to be omitted in large volume spaces containing 5,000 or more cubic feet per occupant.

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

(a) Except as provided in par. (b), ventilation shall be provided during the periods that the room or space is occupied.

(b) Mechanical exhaust ventilation shall be provided for natatoriums even when the space or building is not occupied.

(4) INTAKE OPENINGS. (a) This is a department rule in addition to the requirements in IMC section 401.4.1: 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.

(b) These are department exceptions in addition to the requirements in IMC section 401.4.1 and par. (a):

1. The setback distances as specified in IMC section 401.4.1 and par. (a) shall not apply to the combustion air intake of a direct vent appliance.

2. Where it can be demonstrated that an engineered system design will prevent the maximum concentration of contaminants brought in through the outside air intake from exceeding the maximum contaminant concentration obtainable by providing the separation distances in accordance with IMC section 401.4.1 and par. (a), the outdoor air intakes may be located in accordance with such engineered system design.

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 s. Comm 62.3500, 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 401.4.2:

(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.

(6) CONTAMINANT SOURCES. Substitute the following wording for the requirements in IMC section 401.6: Stationary local sources producing air–borne particulates, heat, odors, fumes, spray, vapors, smoke or gases in such quantities as to be injurious to health shall be provided with an exhaust system in accordance with IMC chapter 5 or a means of collection and removal of the contaminants. Such exhaust shall discharge directly to an approved location at the exterior of the building.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–135: r. and recr. (4) (a) (intro.), cr. (4) (a) 4. and (b) 5., CR 01–139: r. and recr. (4) (a) 3., am. (4) (b) 2. Register June 2002 No. 558, eff. 7–1–02; **CR 06–120: r. and recr. (1), (2) and (4) (a), r. (3), (4) (b) 2. to 4., am. (4) (b) (intro.), 1. and (5) (intro.), renum. (4) (b) 5. to be (4) (b) 2. and am., cr. (6) Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0402 Natural ventilation. This is a department rule in addition to the requirements in IMC section 402: The use of natural ventilation shall be permitted as specified in Table 64.0403.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: am. Register February 2008 No. 626, eff. 3–1–08**.

Comm 64.0403 Mechanical ventilation. (2) OUTDOOR AIR REQUIRED. (a) Substitute the following wording for the exception 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 PROHIBITED. Substitute the following wording for exception 3 in IMC section 403.2.1: Where indicated in Table 64.0403, recirculation of air from such spaces is prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 64.0403.

(4) 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.

(5) TRANSFER AIR. Substitute the following wording for the requirements in IMC section 403.2.2: Except where recirculation from such spaces is prohibited by Table 64.0403, air transferred from occupied spaces is not prohibited from serving as makeup air for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators and smoking lounges. The amount of transfer air and exhaust air shall be sufficient to provide the flow rates as specified in IMC sections 403.3 and 403.3.1. The required out-

door air rates specified in Table 64.0403 shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

(6) VENTILATION RATE. Substitute the following wording for the requirements and exception in IMC section 403.3:

(a) *Ventilation rate determination.* 1. Except as provided in sub. (2) (a) and s. Comm 64.0300, a mechanical ventilation system shall be designed to have the capacity to supply a minimum outdoor airflow rate of 7.5 cfm per person as determined in accordance with Table Comm 64.0403 based on the occupancy of the space and the occupant load or other parameters stated therein. A mechanical ventilation system shall be designed to have the capacity to exhaust air as specified in Table Comm 64.0403 except as provided in par. (c).

2. a. Except as provided in subd. 2. b. to d., 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.

b. 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.

c. 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.

d. 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.

(b) *Adjacent spaces with differing ventilation requirements.* 1. Except as provided in subd. 2., spaces with 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. is not required where an engineered ventilation design system will prevent the concentration of contaminants from exceeding that obtainable by providing a physical separation.

(c) *Exceptions for certain occupancies.* 1.'Toilet rooms.' A toilet room that has only one water closet or urinal and no bathtub or shower may 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 may 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 room, shower room 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.

(7) SYSTEM OPERATION. Substitute the following wording for the requirements in IMC section 403.3.1: The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation may be based on the rate per person indicated in Table 64.0403 and the actual number of occupants present.

(8) COMMON VENTILATION SYSTEM. (a) This is a department alternative to the requirements in IMC section 403.3.2: Where multiple spaces having different ventilation rate requirements are served by a common ventilation system, the minimum amount of outdoor airflow supplied by the ventilation system shall equal the total outdoor airflow required for each space if each space is provided with minimum air changes in accordance with this subsection.

(b) 1. Except as provided in subd. 4., an air change rate of 6 air changes per hour shall be provided in each space.

2. The air change air rate under this subsection shall be determined upon either the actual height of the space or 10 feet from the floor level of the space which ever is less.

3. The air movement providing the required minimum air change shall be that amount that is transferred through the air handling equipment where the return air is diluted or replaced with outside air and supplied back to the space.

4. a. Air change rate of less than 6 air changes per hour is permitted where mechanical cooling is provided to maintain an interior design temperature of 78ºF or lower. The air change rate may not be less than the minimum air changes rate per hour specified in Table 64.0403.

b. Air changes are not required to be provided for spaces required to be mechanically exhausted.

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

Table 64.0403
Ventilation Requirements

Occupancy Classification	Estimated Maximum Occupant Load (persons per 1,000 sq. ft.) [a]	Natural Ventilation Allowed [b]	Exhaust [c] (cfm/net sq. ft. floor area)	Common Ventilation System Alternative – Minimum AC Rate per hour with A/C
Correctional facilities				
Sleeping rooms [d]	20	yes	NR	2.0
Dining halls	100	no	NR	2.0
Guard stations	40	yes	NR	1.5
Dry cleaners, laundries				
Coin−operated dry cleaners	8	yes	NR	1.0
Coin−operated laundries	8	yes	NR	1.0
Commercial dry cleaners	NA	no	2.0	NR
Commercial laundries	NA	no	2.0	NR
Storage, pick up	8	yes	NR	1.0
Apartment laundry rooms	NA	yes	0.5	NR
Education				
Auditoriums	150	no	NR	2.0
Classrooms	50	no	NR	2.0
Day care facilities	30	yes only if ≤ 20 children	NR	2.0
Laboratories (science)	30	no	NR	2.0
Corridors with lockers [e]	NA	NA	NR	NA
Music rooms	50	no	NR	2.0
Smoking lounges [f, g]	NA	no	2.0	NR
Special education	35	no	NR	2.0
Training shops	30	no	NR	2.0
Food and beverage service				
Bars and cocktail lounges	100	no	NR	2.0
Cafeterias, fast food	100	no	NR	2.0
Dining rooms	70	no	NR	2.0
Kitchens (cooking) [g, h]	20	yes	NR	1.0
Health care facilities Hospitals Nursing homes Ambulatory surgery centers	See s. Comm 64.0300	See s. Comm 64.0300	See s. Comm 64.0300	See s. Comm 64.0300
Hotels, motels, resorts and dorms				
Assembly rooms	120	no	NR	2.0
Bathrooms [f, g]	NA	no	35 cfm/room	NR
Bedrooms	footnote i	yes	NR	1.0
Conference rooms	50	no	NR	2.0
Dormitory sleeping areas	20	yes	NR	1.0
Casinos	NA	no	2.0	NR
Living rooms	footnote i	yes	NR	1.0
Lobbies	30	yes	NR	2.0
Industrial/Factory				
Factories and machine shops	13	yes	NR	NR
Foundries	13	yes	NR	NR
Sawmills	NA	yes	NR	NR
Offices				
Conference rooms	50	no	NR	1.5
Office spaces	7	no	NR	1.5
Reception areas	60	no	NR	1.5
Telecommunication centers and data entry	60	no	NR	1.5

Table 64.0403 – Continued
Ventilation Requirements

Occupancy Classification	Estimated Maximum Occupant Load (persons per 1,000 sq. ft.) [a]	Natural Ventilation Allowed [b]	Exhaust [c] (cfm/net sq. ft. floor area)	Common Ventilation System Alternative – Minimum AC Rate per hour with A/C
Places of worship, entertainment and recreation which accommodate less than 100 persons	NA	yes	NR	2.0
Private dwellings, single and multiple				
Living areas	2 people for first bedroom plus one person for each additional bedroom	yes	NR	1.0
Kitchens [g]	NA	yes	100 cfm intermittent or 20 cfm continuous	NR
Toilet rooms and bathrooms [g]	NA	no	Mechanical exhaust capacity 50 cfm intermittent or 20 cfm continuous [j]	NR
Garages, separated by a solid wall for each dwelling	NA	yes	100 cfm/ vehicle	NR
Garages, common for multiple units [f]	NA	no	0.5	NR
Retail stores, sales floors and showroom floors	8	yes	NR	1.0
Seasonal occupancies, camps and lodges				
Dining and recreational areas	15	yes	NR	1.0
Living and sleeping areas	NA	yes	NR	1.0
Club houses	15	yes	NR	1.0
Drive–ins	15	yes	NR	1.0
Specialty shops				
Automotive service and repair garages	NA	no	0.5	NR
Barber shops	25	no	NR	1.0
Beauty salons [k]	NA	no	0.5	NR
Car washes	NA	yes	NR	NR
Clothier, furniture specialty shops	8	yes	NR	1.0
Florist shops	8	yes	NR	1.0
Hardware, drugs, fabrics stores	8	yes	NR	1.0
Supermarkets	8	yes	NR	1.0
Sports and amusement				
Ballrooms and discos	100	no	NR	2.0
Bleacher areas	363 or 18 in./person	no	NR	2.0
Bowling centers (seating areas)	70	no	NR	2.0
Game rooms	70	no	NR	2.0
Ice skating rinks (indoor)	5	no	NR	NR
Natatoriums	NA	NA	2.0 cfm/sq. ft. pool area	NR
Playing floor (gymnasiums)	30	no	NR	2.0
Roller skating rinks (indoor)	30	no	NR	2.0
Spectator areas (non–bleacher)	150	no	NR	2.0
Storage				
Chlorine storage and handling rooms	NA	no	2.0	NR
Enclosed parking garages [L]	NA	no	0.5	NR
Warehouses	NA	NA	NR	NR

Table 64.0403 – Continued
Ventilation Requirements

Occupancy Classification	Estimated Maximum Occupant Load (persons per 1,000 sq. ft.) [a]	Natural Ventilation Allowed [b]	Exhaust [c] (cfm/net sq. ft. floor area)	Common Ventilation System Alternative – Minimum AC Rate per hour with A/C
Theaters				
Auditoriums	150	no	NR	2.0
Lobbies	150	no	NR	2.0
Stages, studios	70	no	NR	2.0
Ticket booths	60	no	NR	2.0
Transportation				
Platforms	100	no	NR	2.0
Waiting rooms	100	no	NR	2.0
Utility and public spaces				
Elevator cars [m]	NA	no	NR	NR
Janitor closets	NA	no	2.0 or 75 cfm/sink [j]	NR
Locker and dressing rooms [f]	NA	no	0.5	NR
Shower rooms	NA	no	2.0	NR
Toilet rooms [f, g]	NA	no	75 cfm/TF [j]	NR
Smoking lounges [f, g]	NA	no	2.0	NR
Workrooms				
Bank vault	5	no	NR	NR
Meat processing	10	yes	NR	NR
Pharmacy	20	yes	NR	1.5
Photo studio	10	yes	NR	1.0
Printing	13	yes	footnote m	NR

NA = not applicable; NR = none required; cfm = cubic feet per minute; TF = toilet fixtures (water closets and urinals); A/C = air conditioning

a Based upon net floor area.

b Natural ventilation is allowed for any occupancy provided an engineered analysis accounts for the number of occupants.

c The ventilation rate is based upon cubic feet per minute per square foot of the floor area being ventilated.

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

e Outdoor air shall be provided at the rate of 10 cfm of lineal foot of corridor length.

f 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.

g Outdoor air shall be provided at the rate of 1.0 cfm/net sq. ft. floor area. Transfer air is permitted in accordance with IMC section 403.2.2.

h 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.

i The minimum mechanical ventilation rate is 15 cfm/room of outside air.

j Natural ventilation may be allowed under this section.

k The classification of a 'beauty' salon 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.

L 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.

m Refer to IMC chapter 5 for exhaust requirements.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–135: renum. (3) to be (3) (b), cr. (3) (a), (4) (a) 6. and (5) (d), am. (5) (a), (b) 1. a., (c) 1. and (6) Table; CR 01–139: renum. (3) to (6) to be (4), (6), (8) and (9), cr. (3), (5) and (7), am. (6) Table, r. and recr. (6) Register June 2002 No. 558, eff. 7–1–02; CR 04–016: am. Table 64.0403 Register December 2004 No. 588, eff. 1–1–05; **CR 06–120: r. (1), (4) (a), (6) (a) 3., 6. and (d), am. (2) (a) and (3), renum. (4) (b) to be (4), r. and recr. (6) (intro.), (a) 1., (8) and Table 64.0403 Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0404 Minimum enclosed garage ventilation. (1) Substitute the following wording for the requirements in IMC section 404.2: Automatic operation of the system shall not reduce the ventilation rate below 0.05 cfm per square foot of the floor area and the system shall be capable of producing a ventilation rate of 0.5 cfm per square foot of floor area.

(2) This is a department alternative to the requirements in IMC sections 404.1 and 404.2: Mechanical ventilation systems for enclosed parking garages are not required to operate continuously where the system conforms to all of the following:

(a) The system is arranged to operate automatically upon detection of carbon monoxide at a level of 35 parts per million (ppm) by automatic detection devices.

(b) If diesel–fueled vehicles are stored, the system is arranged to operate automatically upon detection of nitrogen dioxide at a level of one part per million (ppm) by automatic detection devices.

(c) The system includes automatic controls for providing exhaust ventilation at a rate of 0.5 cfm per square foot for at least 5 hours in each 24–hour period.

(d) The system maintains the garage at negative or neutral pressure relative to other spaces.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–139: r. and recr. (1) Register June 2002 No. 558, eff. 7–1–02; **CR 06–120: r. and recr. Register February 2008 No. 626, eff 3–1–08.**

Comm 64.0501 General. This is a department exception to the requirements in IMC section 501.3: 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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: am. Register February 2008 No. 626, eff 3–1–08.**

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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

Comm 64.0506 Commercial kitchen grease ducts and exhaust equipment. (2) JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS. (a) This is a department alternative to the requirements, but not the exceptions, in IMC section 506.3.2: Joints, seams and penetrations of grease ducts may be made with any other means that provide a liquid–tight seal at 1500ºF and that are listed and labeled for the application.

(b) This is a department rule in addition to the requirements in IMC section 506.3.2.1: Duct joints may also be flanged joints.

(bm) The requirements of IMC section 506.3.3.1 are not included as part of this chapter.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: r. (1) and (2) (c), am. (2) (title) and (a), r. and recr. (2) (b), cr. (2) (bm) Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0507 Commercial kitchen hoods. (1) CAPACITY OF HOODS. Substitute the following wording for the introductory paragraph in IMC section 507.13: Commercial food service hoods shall exhaust a minimum net quantity of air determined either through engineering analysis or in accordance with this subsection and IMC sections 507.13.1 through 507.13.4. 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 IMC sections 507.13.1 through 507.13.4 for the heaviest duty appliance covered by the hood shall be used for the entire hood.

(2) DISHWASHING APPLIANCES. The requirements of IMC section 507.13.5 are not included as part of this chapter.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–139: am. Register June 2002 No. 558, eff. 7–1–02; CR 04–016: renum. to be (3) and am., cr. (1) and (2) Register December 2004 No.588, eff. 1–1–05**; CR 06–120: r. and recr. Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0513 Smoke control systems. Substitute the following wording for the requirements in IMC section 513.3: In addition to the inspection and test requirements which buildings, structures and parts thereof are required to undergo, smoke control systems subject to the provisions of section 909 of the *International Building Code* shall undergo inspections and tests sufficient to verify the proper commissioning of the smoke control design in its final installed condition. The design submission accompanying the construction documents shall clearly detail procedures and methods to be used and the items subject to such inspections and tests. Such commissioning shall be in accordance with generally accepted engineering practice and, where possible, based on published standards for the particular testing involved.

History: CR 04–016: cr. Register December 2004 No. 588, eff. 1–1–05.

Comm 64.0514 Energy recovery ventilation systems. This is a department exception to the requirements in IMC section 514.2: An engineered energy recovery ventilation system design may be used in the systems specified in IMC section 514.2 provided that corrosion, cross–contamination and fouling are addressed by the engineered system.

History: CR 06–120: cr. Register February 2008 No. 626, eff. 3–1–08.

Comm 64.0601 General. Substitute the following wording for the requirements in IMC section 601.2 Exception 1: Use of a corridor as a source of makeup air for exhaust systems in rooms that open directly onto such corridors shall be permitted provided that each such corridor is directly supplied with outdoor air at a rate greater than the rate of makeup air taken from the corridor.

History: CR 06–120: cr. Register February 2008 No. 626, eff. 3–1–08.

Comm 64.0602 Plenums. Substitute the following wording for the requirements, but not the exceptions, in IMC section 602.2.1: Except as required by Sections 602.2.1.1 through 602.2.1.5, materials within plenums shall be noncombustible or 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 E 84 or CAN/ULC S102.2.

History: CR 06–120: cr. Register February 2008 No. 626, eff. 3–1–08.

Comm 64.0603 Duct construction and insulation. History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 04–016: renum. to be (1), (2) renum. from Comm 64.0300 and am. Register December 2004 No. 588, eff. 1–1–05; **CR 06–120: r. Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0604 Insulation. History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–135: renum. (1) to be (3), cr. (1) Register June 2002 No. 558, eff. 7–1–02; correction to renum. (3) to be (2) made under s. 13.93 (2m) (b) 1., Stats., Register June 2002 No. 558; **CR 06–120: r. Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0605 General. History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–135: am. (1), renum. (2) to be (4), cr. (2) and (3) Register June 2002 No. 558, eff. 7–1–02; **CR 06–120: r. Register February 2008 No. 626, eff. 3–1–08.**

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 DHS licensed healthcare facilities as specified in chs. DHS 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 DHS licensed healthcare facilities as specified in chs. DHS 124, 131, 132, and 134, also refer to NFPA standard 90A section 4–3.2 for smoke dampers isolating air handling units.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

Comm 64.0607 Ducts and air–transfer openings. (1) PENETRATIONS OF SHAFT ENCLOSURES. This is a department exception to the requirements in IMC section 607.5.5: Smoke dampers are not required in ducts that are used in the exhaust portion of laboratory ventilating systems which are designed and installed in accordance with NFPA 45.

(2) SMOKE DAMPERS IN HEALTH CARE FACILITIES. This is a department exception to the requirements in IMC section 607.5.4: Smoke dampers are not required in Group I–2 duct penetrations of smoke barriers in fully ducted HVAC systems.

History: CR 04–016: cr. Register December 2004 No. 588, eff. 1–1–05; **CR 06–120: r. and recr. Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0702 Inside air. Substitute the following wording for the requirements in IMC section 702.2: 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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: renum. (1) to be Comm 64.0702 and am., r. (2) Register February 2008 No. 626, eff. 3–1–08.**

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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

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

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

(2) This is a department rule in addition to the requirements in IMC section 801.2: Portable or permanently installed, fuel–fired, unvented heating appliances, except during construction or demolition of a building if the appliances are provided in accordance with ch. Comm 14.

Note: See s. Comm 65.0621 for use of portable, gas–fired, unvented heating appliances.

(3) Substitute the following wording for the requirements in IMC section 801.20 and Exception: Plastic pipe and fittings used to vent appliances shall be installed in accordance with the pipe manufacturer's installation instructions and the appliance manufacturer's installation instructions. Solvent cement joints between ABS pipe and fittings shall be cleaned.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 04–016: am. (2) Register December 2004 No. 588, eff. 1–1–05; **CR 06–120: am. (2), cr. (3) Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.0900 Specific criteria for duct humidifiers. History: CR 01–135: cr. Register June 2002 No. 558, eff. 7–1–02; **CR 06–120: r. Register February 2008 No. 626, eff. 3–1–08.**

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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

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 chs. 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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: r. (4) Register February 2008 No. 626, eff. 3–1–08.**

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.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.

Comm 64.1201 Hydronic piping. History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; **CR 06–120: r. Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.1300 Fuel oil piping and storage. History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02**; CR 06–120: r. Register February 2008 No. 626, eff. 3–1–08.**

Comm 64.1500 Referenced standards. (2) This is a department rule in addition to the requirements in IMC chapter 15: The following standards are hereby incorporated by reference into this code:

(a) AIA Guidelines for Design and Construction of Health Care Facilities, 2006.

(b) UL 197–93, Commercial Electric Cooking Appliances – With Revisions Through January 2000.

(c) CAN/ULC S102.2–03, Surface Burning Characteristics of Floor Covering and Miscellaneous Materials, 2003.

Note: AIA guidelines may be purchased from the American Institute of Architects, Order Department, 9 Jay Gould Court, P.O. Box 753, Waldorf, MD 20601.

UL standards may be purchased from Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062–2096.

CAN/ULC standards may be purchased from Underwriters Laboratories of Canada, 7 Underwriters Road, Toronto ON, M1R 3B4.

Copies of the standards adopted under this section are on file in the offices of the department and the legislative reference bureau.

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02; CR 01–139: am. Register June 2002 No. 558, eff. 7–1–02; correction in (1) made under s. 13.93 (2m) (b) 7., Stats., Register April 2003 No. 568; CR 04–016: r. and recr. (2) Register December 2004 No. 588, eff. 1–1–05; **CR 06–120: r. (1), am. (2) (a), cr. (2) (c) Register February 2008 No. 626, eff. 3–1–08.**

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

History: CR 00–179: cr. Register December 2001 No. 552, eff. 7–1–02.