

CR 83-71

# RULES CERTIFICATE

STATE OF WISCONSIN )  
 ) SS  
DEPT. OF INDUSTRY, )  
LABOR & HUMAN RELATIONS)

TO ALL TO WHOM THESE PRESENTS SHALL COME, GREETINGS:

I, Howard S. Bellman, Secretary of the Department of Industry, Labor and Human Relations, and custodian of the official records of said department, do hereby certify that the annexed rule(s) relating to Chs Ind 50-64 - Bldg & Htg, Vent & A/C Code - HVAC Rules were duly approved and adopted by this department on 11/14/83.

(Subject)

(Date)

I further certify that said copy has been compared by me with the original on file in this department and that the same is a true copy thereof, and of the whole of such original.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the official seal of the department at 8:00 am in the city of Madison, this 14<sup>th</sup> day of November A.D. 1983.

Howard S. Bellman

Secretary

**RECEIVED**

NOV 15 1983

8:15 am  
Revisor of Statutes  
Bureau

# ORDER OF ADOPTION

Pursuant to authority vested in the Department of Industry, Labor and Human Relations by section(s) 101.02(1), 101.02(15)(h)-(j) Stats., the Department of Industry, Labor and Human Relations hereby  creates;  amends;  repeals and recreates; and  repeals and adopts rules of Wisconsin Administrative Code chapter(s):

Ind. 50-64 Building & Heating, Ventilating & Air Conditioning Code  
(Number) HVAC Rules  
(Title)

The attached rules shall take effect on the first day of the month following publication in the Wisconsin Administrative Register \_\_\_\_\_, pursuant to section 227.026, Stats.

Adopted at Madison, Wisconsin, this 14<sup>th</sup>  
day of November, A.D., 1983.

DEPARTMENT OF INDUSTRY, LABOR AND HUMAN RELATIONS

Howard S. Bellman  
Secretary

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# RULES in FINAL DRAFT FORM

**Rule:** Chs. Ind 50-64 (Ind 64)

**Relating to:** Building & Heating, Ventilating & Air Conditioning

Code - HVAC Rules

**Clearinghouse Rule No.:** 83-71

Administrative rules to repeal s. Ind 64.63 (2) (b) Note #1; to amend ss. Ind 51.27 (5), 51.27 (7a), 52.54 (1), 64.42 (1) (intro.), 64.42 (1) (a), 64.61 (1), 64.64 "Title", 64.64 (1), 64.65 (3) (b) 1., 64.67 (4) (b) 3; to repeal and recreate ss. Ind 54.14 (3), Table 64.21, 64.22 (4), 64.67 (2) (b); to create ss. Ind 58.24 (3), 64.08 (5), 64.22 (5) (c), 64.22 (7) (d), 64.22 (8), 64.48 (2) (f) relating to heating, ventilating and air conditioning (HVAC) in public buildings and places of employment.

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ANALYSIS OF RULES

The proposal updates and expands the current HVAC rules of the Building and Heating, Ventilating and Air Conditioning Code. The following is a summary of the major changes included in the proposal:

- 1) Recognized national standards for HVAC equipment and systems are updated to current editions or are adopted;
- 2) Ductless air circulating and treatment devices are prohibited in taverns and restaurants;
- 3) Fireplace requirements for health care facilities are updated;
- 4) Rules for gravity siphon-type roof ventilators are added;
- 5) Rules for solid fuel and waste oil burning equipment are updated and made more consistent;
- 6) Use of direct-fired unvented gas equipment is clarified;
- 7) Fire damper rules are updated and clarified;
- 8) Rules for listed equipment with venting systems are added;
- 9) Terminology for garages and showrooms is clarified; and
- 10) Kitchen exhaust hood rules are updated.

The proposed rules were developed in conjunction with the Project Committee for Heating, Ventilating and Air Conditioning and the Building Code Advisory Review Board. The following is a listing of the members of the project committee and the Review Board:

Project Committee for Heating, Ventilating & Air Conditioning

- Bert Fredericksen, Public
- Keith Goodwin, Department of Health and Social Services
- Robert L. Heyman, Mechanical Contractors Association of Wisconsin
- Jay F. Jorgensen, Wisconsin Chapter, American Society of Heating, Refrigerating and Air Conditioning Engineers
- Gene K. Miller, Wisconsin Society of Professional Engineers
- Harold L. Olsen, Consulting Engineers Institute of Wisconsin
- John H. Osborne, Sheet Metal and Air Conditioning Contractors Association of Wisconsin
- John Paulson, Wisconsin Society of Architects/American Institute of Architects
- Roger Kunkel, Wisconsin Utilities Association
- Joe Turner, City of Madison

Building Code Advisory Review Board

- Sharyl Bisgard, League of Women Voters
- Ronald W. Chiapete, Wisconsin State Fire Chiefs Association
- Victor Halloran, Wisconsin Society of Architects/AIA
- Lee C. Jensen, City of Milwaukee
- James E. Knothe, Wisconsin Society of Professional Engineers
- Marshall Kuhnly, Wisconsin State AFL-CIO
- Michael G. Laskis, State Bar of Wisconsin
- Thomas Lorenz, Master Builders Association of Wisconsin, Inc.
- George J. Mark, Wisconsin Builders Association
- Donald Roth, League of Wisconsin Municipalities
- David J. Schield, Wisconsin Association of Manufacturers and Commerce
- Stephen D. Schlough, Wisconsin Department of Health and Social Services
- Richard C. Schumacher, Wisconsin Chapter, Associated General Contractors of America, Inc.
- William Shea, Building Owners and Manufacturers Association/Income Property Owners Association
- Jahn Tinglum, Wisconsin Department of Public Instruction
- Fred Wegener, Wisconsin Department of Administration, Division of State Facilities Management
- Larry J. Wills, Wisconsin Chapter, Society of Fire Protection Engineers

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Pursuant to the authority vested in the state of Wisconsin's Department of Industry, Labor and Human Relations by ss. 101.02 (1) and 101.02 (15) (h) to (j), Stats., the department hereby repeals, amends, repeals and recreates and creates rules interpreting ss. 101.02 (15) (h) to (j), Stats., as follows:

SECTION 1. Ind 51.27 (5) is amended to read:

Ind 51.27 (5) American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018, SPECIFICATION FOR REINFORCED GYPSUM CONCRETE, ANSI A59.1-1968 (R-1972); SPECIFICATION FOR VERMICULITE CONCRETE ROOFS AND SLABS ON GRADE, ANSI A122.1-1965; DIRECT GAS-FIRED MAKE-UP AIR HEATERS, ANSI Z83.4-1980; PERFORMANCE SPECIFICATIONS AND METHODS OF TESTING FOR SAFETY GLAZING MATERIALS USED IN BUILDINGS, ANSI Z97.1-1975.

SECTION 2. Ind 51.27 (7a) is amended to read:

Ind 51.27 (7a) National Fire Protection Association, Batterymarch Park, Quincy, Mass. 02269; STANDARD FOR PORTABLE FIRE EXTINGUISHERS, NFPA No. ~~40-1978~~ 10-1981; STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS, NFPA No. 13-1980; STANDARD FOR THE CARE AND MAINTENANCE OF SPRINKLER SYSTEMS, NFPA No. 13A-1978; STANDARD FOR THE INSTALLATION OF CENTRIFUGAL FIRE PUMPS, NFPA No. 20-1980; STANDARD FOR WATER TANKS FOR PRIVATE FIRE PROTECTION, NFPA No. ~~22-1978~~ 22-1981; STANDARD FOR OUTSIDE PROTECTION, NFPA No. ~~24-1977~~ 24-1981; STANDARD FOR THE INSTALLATION OF OIL-BURNING EQUIPMENT, NFPA No. 31-1978; NATIONAL FUEL GAS CODE, NFPA No. ~~54-1974~~ 54-1980; STANDARD FOR CENTRAL STATION PROTECTIVE SIGNALING SYSTEMS, NFPA No. ~~71-1977~~ 71-1982; STANDARD FOR THE INSTALLATION, MAINTENANCE AND USE OF LOCAL PROTECTIVE SIGNALING SYSTEMS FOR GUARD'S TOUR, FIRE ALARM AND SUPERVISORY SERVICE, NFPA No. 72A-1979; STANDARD FOR AUXILIARY PROTECTIVE SIGNALING SYSTEMS, NFPA No. 72B-1979; STANDARD FOR REMOTE STATION PROTECTIVE SIGNALING SYSTEMS, NFPA No. ~~72C-1975~~ 72C-1982; STANDARD FOR PROPRIETARY PROTECTIVE SIGNALING SYSTEMS, NFPA No. 72D-1979; STANDARD ON AUTOMATIC FIRE DETECTORS, NFPA No. ~~72E-1978~~ 72E-1982; STANDARD FOR HOUSEHOLD FIRE WARNING EQUIPMENT, NFPA No. 74-1980; MANUAL ON CLEARANCES FOR HEAT PRODUCING APPLIANCES, NFPA No. 89M-1976; STANDARD FOR THE INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS, NFPA No. 90A-1981; STANDARD FOR CHIMNEYS, FIREPLACES AND VENTS, NFPA No. 211-1980.

SECTION 3. Ind 52.54 (1) is amended to read:

Ind 52.54 (1) SINGLE FIXTURE TOILET ROOMS AND BATHROOMS. (a) Except as provided in par. (b), windows may be omitted in bathrooms or toilet rooms containing a single fixture (having one water closet or urinal) and lavatory or bathing facility where artificial light and either mechanical exhaust ventilation or an approved ~~duct-less~~ ductless air circulating and treatment device is provided.

(b) The use of ductless air circulating and treatment devices in taverns and restaurants is prohibited.

~~Note: The department will accept ductless air circulating and treatment devices conforming to standard C-10 as adopted by the National Sanitation Foundation (NSF).~~

SECTION 4. Ind 54.14 (3) is repealed and recreated to read:

Ind 54.14 (3) SUSPENDING EQUIPMENT. (a) Except as provided in par. (b), boilers up to 200,000 Btu input, water heaters up to 200,000 Btu input, gas and liquid fuel-fired space heaters, suspended furnaces, vented and unvented unit heaters may be used without an enclosure where approved by the department. Where suspended furnaces, vented and unvented unit heaters, boilers and water heaters are used without an enclosure, all such units shall be located at least 7 feet above the floor. The blow-off pipe for suspended boilers and water heaters shall be extended down to within 6 inches of the floor.

(b) The rated enclosure for heating equipment in factories may be omitted if the burner of the equipment is located at least 7 feet off the floor and the equipment is protected from physical damage.

Note: See s. Ind 64.21 for additional requirements.

SECTION 5. Ind 58.24 (3) is created to read:

Ind 58.24 (3) FIREPLACES. Fireplaces shall be permitted in health care facilities provided:

(a) The fireplace is installed and used in areas other than patient sleeping areas which are separated from the patient sleeping areas by construction having at least a one-hour fire resistive rating;

(b) The fireplace is equipped with safety screens and a heat tempered glass fireplace enclosure capable of withstanding temperatures up to 650° F.; and

(c) Combustion air for the fireplace is taken directly from outside the building.

SECTION 6. Ind 64.08 (5) is created to read:

Ind 64.08 (5) GRAVITY SIPHON-TYPE ROOF VENTILATORS. (a) Except as provided in par. (b), gravity siphon-type roof ventilators shall be sized to provide a free area so that the velocity of the air does not exceed 300 feet per minute.

(b) The allowable velocity specified in par. (a) may be increased to 600 feet per minute provided the outside air is supplied by mechanical means.

SECTION 7. Table 64.21 is repealed and recreated to read:

Location and Type of Occupancy	VENTED UNITS						UNVENTED UNITS		ELECTRIC Furnaces, Unit Heaters, Heat Pumps, Baseboard Heaters, etc.	WATER OR STEAM Unit Ventilators, Heaters, Makeup Air Units, Baseboard Heaters, etc.
	Gas or Oil or Solid Fuel Boilers	Gas or Oil or Solid Fuel Furnaces	Gas or Oil Unit Heater	Gas or Oil Infrared	Gas or Oil Space Heater	Solid Fuel Space Heater <sup>1,2</sup>	Gas Direct Fired Makeup Air <sup>3,4</sup>	Gas Infrared		
Type of Occupancy	Rated Enclosure	Rated Enclosure	Suspended or Guarded <sup>5</sup>	Suspended or Guarded <sup>5</sup>	Suspended or Guarded <sup>5</sup>		Suspended or Guarded <sup>5</sup>	Suspended or Guarded <sup>5</sup>		
Factories	Yes	Yes <sup>5</sup>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Mercantile Buildings	Yes	Yes	Yes	Yes	Yes	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P.	N.P.	
Office Buildings	Yes	Yes	Yes	Yes	N.P.	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P.	N.P.	
Places of assembly, entertain- ment, recreation, worship or dining (100 persons or less)	Yes	Yes	Yes	Yes	Yes	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P. <sup>7</sup>	N.P.	
Tennis Facilities (court areas only)	Yes	Yes	Yes	Yes	Yes	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P.	N.P.	
Tennis Facilities (all other areas)	Yes	Yes	N.P. <sup>8</sup>	N.P. <sup>8</sup>	N.P.	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P.	N.P.	
Theaters & places of assembly, entertainment, recreation, worship or dining (more than 100 persons)	Yes	Yes	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	PERMITTED IN ALL OCCUPANCIES
Restaurants	Yes	Yes	N.P.	N.P.	N.P.	N.P.	N.P.	N.P. <sup>8</sup>	N.P.	
Tennis Facilities (court areas only)	Yes	Yes	Yes	Yes	Yes	N.P.	N.P.	N.P.	N.P.	
Tennis Facilities (all other areas)	Yes	Yes	N.P. <sup>8</sup>	N.P. <sup>8</sup>	N.P.	N.P.	N.P.	N.P.	N.P.	
Schools & Other Places of Instruction	Yes	Yes	N.P. <sup>9</sup>	N.P. <sup>10</sup>	N.P. <sup>10</sup>	N.P.	N.P.	N.P. <sup>9</sup>	N.P.	
Hospitals, Nursing Homes & Penal Institutions	Yes	Yes	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	
Residential Occupancies	Yes	Yes	N.P.	N.P.	N.P.	N.P. <sup>11</sup>	N.P. <sup>14</sup>	N.P.	N.P.	
Hazardous Occupancies										
Garages	Yes	Yes	Yes <sup>12</sup>	Yes <sup>12</sup>	Yes <sup>12</sup>	N.P. <sup>15</sup>	N.P.	Yes <sup>12</sup>	Yes <sup>12</sup>	
Aircraft Hangars	Yes	Yes	Yes <sup>13</sup>	Yes <sup>13</sup>	Yes <sup>13</sup>	N.P.	N.P.	Yes <sup>13</sup>	Yes <sup>13</sup>	
Day Care Centers	Yes <sup>16</sup>	Yes	N.P.	N.P.	N.P.	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P.	N.P.	
Community Based Residential Facilities <sup>17</sup>	Yes	Yes	N.P.	N.P.	N.P.	N.P. <sup>6</sup>	N.P. <sup>6</sup>	N.P.	N.P.	PERMITTED IN ALL OCCUPANCIES

N.P. = Not Permitted

Unlisted Occupancies - Use the listed occupancy in the table that is most similar to the subject occupancy.

Clearances - Equipment shall be installed in accordance with the clearance from combustibles indicated in the name plate of the unit.

- 1 See s. Ind 64.22 (7) (d) for fireplace requirements.
- 2 All solid-fuel fired space heaters shall be located in occupied space or in a space provided with approved smoke detectors and located or guarded to maintain clearances to combustibles and prevent accidental damage or contact with hot surfaces. Solid-fuel burning stoves are limited to 150,000 Btu/hr output.
- 3 Except as provided in Footnote 4, direct-fired makeup air units shall be mechanically exhausted in the range of 90% to 110% of the air supplied.
- 4 See s. Ind 64.22 (4) for other permitted uses of direct fired unvented natural gas heaters.
- 5 Where permitted, such equipment other than infrared shall be located in an occupied space (see s. Ind 64.22 (3)) and suspended at least 7 feet above the floor or guarded to maintain clearances to combustibles and prevent accidental damage. Infrared equipment shall be located at least 8 feet above the floor. Suspension of solid-fuel fired equipment is not permitted. See s. Ind 54.14 (3) for additional requirements.
- 6 Permitted with combustion air ducted to unit in occupancies less than 3,000 square feet gross area and with occupant load less than 100 persons.
- 7 Permitted in kitchens to provide makeup air for kitchen exhaust systems if located outside building or in a rated enclosure.
- 8 Spectator areas in tennis facilities may be served by suspended equipment located in court areas.
- 9 Permitted only in shops with a 4-hour separation from other areas of the school building.
- 10 Permitted only in shops with a 4-hour separation from other areas of the school building. Low temperature vented infrared heating units may be used providing the temperature at the unit does not exceed 300° F.
- 11 Gas-fired, direct-vent wall furnaces are permitted in apartments and motels.
- 12 Suspended heating units are allowed in garages if located at least 8 feet off the floor. Suspension of solid-fuel fired equipment is not permitted.
- 13 Suspended heating units are allowed if located at least 10 feet above the upper surface of the wings or engine enclosure of the aircraft. Suspension of solid-fuel fired equipment is not permitted.
- 14 Solid-fuel fired space heaters are permitted in rowhouse units only.
- 15 Waste oil burners are permitted provided they are installed on mezzanines or service platforms located at least 9'-0" above the main floor, are visible from the main floor and are guarded as specified in this section.
- 16 See s. Ind 60.25 for smoke detector alternative.
- 17 See s. Ind 61.24 for requirements.

SECTION 8. Ind 64.22 (4) is repealed and recreated to read:

Ind 64.22 (4) GAS- OR OIL-FIRED RADIANT HEATERS AND DIRECT FIRED UNVENTED NATURAL GAS HEATERS. Gas- or oil-fired radiant heaters and direct fired unvented natural gas heaters are subject to the following provisions:

(a) The heaters shall be equipped with an automatic pilot of the complete shutoff type or with a 100% shutoff electric ignition;

(b) If unvented radiant heaters or direct fired unvented natural gas heaters are used, mechanical means shall be provided to supply at least 4 cfm of outside air per 1000 Btu per hour of installed heaters;

(c) Gravity siphon-type roof ventilators or mechanical exhaust shall be provided to remove the amount of air supplied. Gravity siphon-type roof ventilators shall be sized to provide a free area so that the velocity of the air does not exceed 600 feet per minute;

(d) Oil-fired radiant heaters shall be equipped with mechanical pressure-atomizing burners; and

(e) Direct fired unvented natural gas heaters shall comply with the provisions of American National Standards Institute (ANSI) standard Z83.4-1980, Direct Gas-Fired Make-Up Air Heaters.

SECTION 9. Ind 64.22 (5) (c) is created to read:

Ind 64.22 (5) (c) The use of unvented space heaters fueled by natural gas, kerosene, alcohol or other fuel shall be prohibited based on the facts of oxygen depletion; contamination from carbon monoxide, carbon dioxide, nitrogen dioxide, formaldehyde and other combustion-related contaminants; and water vapor development.

SECTION 10. Ind 64.22 (7) (d) is created to read:

Ind 64.22 (7) (d) Permitted Installations. Fireplaces are permitted in the following applications:

1. In all occupancies within the scope of chs. Ind 54 and 55;
2. In health care facilities as specified in s. Ind 58.24 (3);
3. In common use areas and individual living units in all residential occupancies except hotels and motels; and
4. In lobbies and other common use areas of motels and hotels but not in individual sleeping rooms.

SECTION 11. Ind 64.22 (8) is created to read:

Ind 64.22 (8) FLOOR-STANDING VENTED OR UNVENTED EQUIPMENT. Floor-standing, vented or unvented unit heaters, furnaces and boilers in metal fabricating plants, foundries and machine shops are exempt from the requirements of s. Ind 54.14.

SECTION 12. Ind 64.42 (1) (intro) is amended to read:

Ind 64.42 (1) REQUIRED FIRE DAMPERS AND FIRE CURTAIN DOORS. All heating and ventilating ducts except underground ducts used with counterflow or downflow heating equipment, which terminate at or pierce code-required, hourly rated wall, floor or floor-ceiling assemblies as specified in Table 51.03-A and rated enclosures shall be protected as follows:

SECTION 13. Ind 64.42 (1) (a) is amended to read:

Ind 64.42 (1) (a) One-hour rated assemblies and enclosures shall be protected with 1-1/2 hour rated fire dampers where continuous steel ductwork to the air handling device is not provided for at least 6 feet on either side of the assembly or enclosure;

SECTION 14. Ind 64.48 (2) (f) is created to read:

Ind 64.48 (2) (f) Equipment Listed With Venting System. Venting systems included with the listing of the heating appliance may be used subject to the requirements and limitations of the listing.

SECTION 15. Ind 64.61 (1) is amended to read:

Ind 64.61 (1) SCOPE. This classification includes all areas where motor-driven vehicles are repaired involving the fuel system components or requiring the operation of the internal combustion engine.

SECTION 16. Ind 64.63 (2) (b) Note #1 is repealed.

[Note to Revisor: Please delete "#2" in remaining note since Note #1 is now repealed.]

SECTION 17. Ind 64.64 (Title) and (1) are amended to read:

Ind 64.64 VEHICLE SHOWROOM. (1) SCOPE. This classification includes all vehicle showrooms with offices and occupancies unless designed as part of the vehicle garage adjacent to repair or storage areas where all vehicles displayed in the showroom are without batteries and fuel tanks are empty and free of fumes.

SECTION 18. Ind 64.65 (3) (b) 1. is amended to read:

Ind 64.65 (3) (b) 1. 'Exception.' Mechanical exhaust ventilation may be omitted from toilet rooms or bathrooms having one water closet or urinal except in taverns and restaurants, or from janitor closets having one service sink or receptor, where an approved ductless air circulating and treatment device is provided.

~~Note. The Department of Health and Social Services prohibits the use of ductless air circulating and treatment devices in licensed hospitals and nursing homes.~~

SECTION 19. Ind 64.67 (2) (b) is repealed and recreated to read:

Ind 64.67 (2) (b) Required Exhaust Hood. Exhaust hoods shall be required where frying, including deep-fat frying and surface frying, or broiling or both is conducted as part of a regular commercial operation involving ranges, griddles, fryers, broilers and similar grease-producing equipment.

SECTION 20. Ind 64.67 (4) (b) 3. is amended to read:

Ind 64.67 (4) (b) 3. 'Slotted-Type Hood.'  $V = 350$  feet per minute through the slot opening. The slot shall be at least 3 inches in width and shall extend around the open sides of the hood.

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EFFECTIVE DATE

Pursuant to s. 227.026 (1) (intro), Stats., these rules shall take effect on the first day of the month following publication in the Wisconsin Administrative Register.

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