Location and Type of Occup Pactories Mercantile buildings Mercantile buildings Mercantile buildings Mercantile buildings Mercantile buildings Mercantile buildings Places of assembly, entertainmer recreation and dining (less the Places of assembly assembly enter all contraction theaters and places of assembly persons or more) Tennis facilities (court areas Tennis facilities (court areas Tennis facilities (court areas Tennis facilities (all other a Restaurants Tennis facilities (court areas Tennis facilities (court areas Tennis facilities (all other a Restaurants Court areas Tennis facilities (all other a Tennis facilities (all other a Tennis facilities (court areas Tennis facilities (court areas there are an areas Aircret fired magers Aircret fired makeup air uni ² The rated enclosure may be ³ Permitted in retail stores le ⁵ Permitted only in shops wi ⁶ Cas-fired, direct-vent wall ⁹ ⁶ Cas-fired, direct-vent wall ⁹	Lotetion and Type of Occupancy Case of Ol Tymes Case of Ol Case of Case of Care of Case of Care of Case o			VE	VENTED UNITS	SL		UNVENTED UNITS	STINU CI	ELECTRIC	WATER-LOW PRES. STEAM
Central Supended Unit Interned Space Finate Maleuch Interned Unit Interned Space Finate Maleuch Interned Interned Space Finate Maleuch Interned Interned Space Finate Maleuch Interned Interned Space Finate Air Heater Maleuch Heater Air Heater Air Heater Maleuch Heater Air Heater Air Heater Maleuch Heater Heater Heater<	Unit Infrared Space Finate Infrared Infr	Location and Type of Occupancy	Gas or O	il Furnace	Gas or Oil	Gas or Oil	Gas or Oil	Gas Dir.	Gas	Furnaces,	Unit
Tated Tated Test <	Tatel Testel Tester Testet Testet Testet </th <th></th> <th>Central</th> <th>Suspended</th> <th>Unit Heater</th> <th>Infrared</th> <th>Space Heater</th> <th>Fired Makeup Air¹</th> <th>Infrared</th> <th>Unit Heaters, Heat Pumps, Basebrd</th> <th>Ventilatòrs, Heaters, Makeup Air Units,</th>		Central	Suspended	Unit Heater	Infrared	Space Heater	Fired Makeup Air ¹	Infrared	Unit Heaters, Heat Pumps, Basebrd	Ventilatòrs, Heaters, Makeup Air Units,
Yes NP NP NP NP NP NP NP NO NO NP NO NO NP NP NO NO NP NO NP NP NP NO NP NO NO NP ND	Type of Occupancy Yes Yes Yes NP Yes		Rated Enclosure	7 feet. above floor		7 feet above floor		7 feet above floor	7 feet above floor		Baseboard Heaters, etc.
Retortions Yest NP NP<	Retoring Neet Yes NP	Type of Occupancy				5 (1935 (1945	2 2 2 2	54 8 4 65			
Mercencile building: Yes Yes NP NP NP NP Offee building: Places of assembly, extertainment, recession and diming (less than 10) Yes Yes NP N	Merential Yes Yes Yes NP	Factories	Yes ²	Yes	Yes	Yes	N.P.	Yes	Yes	S	S
Office Ves Yes Yes NP NP NP Offices of assembly. Termins facilities Yes Yes Yes Yes NP NP NP reseation and diming (less than 100 Yes Yes Yes Yes NP NP NP NP reseation and workip 000 Yes NP NP NP NP NP reseatament, and workip 000 Yes NP NP <td>Places of assembly: Yes Yes Yes NP <</td> <td>Mercantile buildings</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>N.P.³</td> <td>N.P.⁴</td> <td>N.P.</td> <td>N.P.</td> <td>:91;</td> <td>911</td>	Places of assembly: Yes Yes Yes NP <	Mercantile buildings	Yes	Yes	Yes	N.P. ³	N.P. ⁴	N.P.	N.P.	: 9 1;	911
Percensity Yes Yes Yes Yes Yes Yes N.P. N.P. N.P. N.P. N.P. OCCUP Theaters and places of assembly, entertainment, and worship (100 Yes N.P. N.P. N.P. N.P. N.P. N.P. N.P. N.P. N.P. OCCUP Persons or more) Yes N.P. N.P.<	Therease of search of the second of	Office buildings Places of assembly, entertainment,	Yes	Yes	Yes	a Z	Yes	a Z	a' N	ON¥4	ON¥∢
Tennis facilities Tennis facilities Tremis facilities N.P. N.P. N.P. N.P. OC Thereare and vocably (10) restructament, and vocably (10) Yes N.P. N.P. N.P. N.P. N.P. OC Restaurant, and vocably (10) Yes N.P.	Tennis facilities Yes Yes Yes Yes NP NP NP NO Theres and places of assently. retratianment, and worship (100 Yes NP	persons)	Yes	Yes	Yes	Yes	N.P.	N.P.5	N.P.	IU(IU:
matter N.P. M.P.	entertainment, and workinp (100 periors or more) with a new part of the second of the	Tennis facilities Theaters and places of assembly,	Yes	Yes	Yes	Yes	NP	A'N	d'X	000	000
Permute statute Yes N.P. N.P. N.P. N.P. A Termis facilities (court areas) Yes N.P. M.P. N.P. M.P. N.P. N.P. M.P. N.P. M.P. N.P. M.P. M.P	Pressue or stands Yes N.P. N.P. <td>entertainment, and worship (100</td> <td>Vee</td> <td>4 X</td> <td>đN</td> <td>A Z</td> <td>A Z</td> <td>д Z</td> <td>р Х</td> <td>T</td> <td>11</td>	entertainment, and worship (100	Vee	4 X	đN	A Z	A Z	д Z	р Х	T	11
Termis facilities (court areas only) Yes Yes Yes NP NP <t< td=""><td>Termis facilities (court areas only) Yes Yes Yes Yes NP <</td><td>Restaurants of the second s</td><td>Yes</td><td>A Z</td><td>Å</td><td>N P</td><td>L L</td><td>N.P.5</td><td>A.N.</td><td>V</td><td>A</td></t<>	Termis facilities (court areas only) Yes Yes Yes Yes NP <	Restaurants of the second s	Yes	A Z	Å	N P	L L	N.P.5	A.N.	V	A
Termis facilities (all other areas) Yes N.P. M.P. N.P. M.P. N.P. M.P. M.P.<	Termis facilities (all other areas) Yes N.P. N.P.<	Tennis facilities (court areas only)	Yes	Yes ⁶	Yes	Yes	N.P.	N.P.	N.P.	NI	NI
Schools & other places of instruction Yes N.P. M.P. M.P. N.P. M.P. M.P	Schools & other places of instruction Yes N.P. N.P	Tennis facilities (all other areas)	Yes	N.P. ⁶	N.P. ⁶	N.P.	N.P.	N.P.	N.P.	Ð	C
Image: Second and the second and se	Interpretation occupancies Yes N.P.	Schools & other places of instruction Unwited munical house & model instru	Yes Vac	NP.'	N.P.7	Α.N N N N N	A N A N	d'N D'D	d Z Z	FLL	e, L.L
Garages Yes	Garages Yes Yes Yes Yes N.P. Yes Ye	Residential occupancies Hazardous occupancies	Yes	A.P.	N.P.	NP.	NP.8	N.P.	A N	IWHE	IMAS
Aircraft hangars Yes Yes N.P. N.P. N.P. Yes 0 Day care centers Yes N.P. N.P. <td>an <mark>a</mark>lzi da anterio de activitados de la composición de la</td> <td></td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>Yes</td> <td>N.P.</td> <td>Yes</td> <td>Yes⁹</td> <td>Iđ.</td> <td>H</td>	an <mark>a</mark> lzi da anterio de activitados de la composición de la		Yes	Yes	Yes	Yes	N.P.	Yes	Yes ⁹	Iđ.	H
Day care centers Yes N.P.	ã z		Yes	Yes ¹⁰	Yes ¹⁰	Yes ¹⁰	N.P.	Yes ¹⁰	Yes ¹⁰		
 N.P. = Not permitted. ¹ Direct-fired makeup air units shall be mechanically exhausted in the range of 90% to 110% of the air supplied. ² The rated enclosure may be omitted if the burner of the equipment is located at least 7 feet off the floor [section Ind 54.14 (3) a Permitted in mercantiles having a total capacity of less than 100 persons. ² Permitted in mercantile buildings having a total capacity of less than 100 persons. ⁴ Permitted in tratil stores less than 1500 square feet gross area with combustion air ducted to unit. ⁵ Permitted in kitchens to provide makeup air for kitchen exhaust systems if located outside building or in a rated enclosure. ⁶ Spectator areas in termis facilities may be served by suspended equipment located in court areas. ⁷ Permitted only in shops with a 4-hour separation from other parts of the building. ⁸ Gas-fired, direct-vent wall furnaces are permitted in apartments and motels. ⁹ Suspend heating units in garages at least 8 feet off the floor. 	Z she at the other and the offer the second se	Day	Yes	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.		
 ³ Permitted in mercantile buildings having a total capacity of less than 100 persons. ⁴ Permitted in retail stores less than 1500 square feet gross area with combustion air ducted to unit. ⁵ Permitted in kitchens to provide makeup air for kitchen exhaust systems if located outside building or in a rated enclosure. ⁶ Spectator areas in tennis facilities may be served by suspended equipment located in court areas. ⁷ Permitted only in shops with a 4-hour separation from other parts of the building. ⁸ Gas-fired, direct-vent wall furnaces are permitted in apertments and motels. ⁹ Suspend heating units in garages at least 8 feet off the floor. 			be mechani if the bur	cally exhaust ser of the equ	ed in the rai noment is lo	age of 90% t scated at lea	o 110% of t st 7 feet off	he air suppli the floor [se	ied. ction Ind 5	ତ	
⁴ Permitted in retail stores less than 1500 square feet gross area with combustion air ducted to unit. ⁵ Permitted in kitchens to provide makeup air for kitchen exhaust systems if located outside building or in a rated ⁶ Spectator areas in tennis facilities may be served by suspended equipment located in court areas. ⁷ Permitted only in shops with a 4-hour separation from other parts of the building. ⁸ Gas-fired, direct-vent wall furnaces are permitted in apartments and motels. ⁹ Suppend heating units in garages at least 8 feet off the floor.			aving a tot:	d capacity of	less than 10	0 persons.		i di Gr Anti Anti			
⁶ Spectator areas in tennis facilities may be served by suspended equipment located in court areas. ⁷ Permitted only in shops with a 4-hour separation from other parts of the building. ⁸ Gas-fired, direct-vent wall furnaces are permitted in apartments and motels. ⁹ Suspend heating units in garages at least 8 feet off the floor.		4 0	1500 square	r feet gross al z bitchen er	rea with com	abustion air . a if located .	ducted to un sutside build	it. ing or in a r	ated enclos		
r 80 69 6		Q	tay be serve	d by suspen	ded equipme	int located in	1 court areas				
⁶ Gas-fired, direct-vent wall 1 ⁹ Suspend heating units in g		r 0	ur separati	on from othe	r parts of th	e building.					
Suspend heating units in garages at least 8 feet off the floor.	⁶ Suspend heating units in garages at least 8 feet off the floor. ¹⁰ Suspend unit 10 feet above the upper surface of the wings or engine enclosure of the aircraft. ¹⁰ <i>Unlisted occupancies</i> — Use the above occupancy that is most similar to the listed occupancy. ¹⁰ <i>Columned occupancies</i> — Use the above occupancy that is nost similar to the listed occupancy.	⁶ Gas-fired, direct-vent wall	are permitt	ed in apartm	tents and mo	otels.					
	¹⁰ Suspend unit 10 feet above the upper surface of the wings or engine enclosure of the aircraft. Unlisted occupancies — Use the above occupancy that is most similar to the listed occupancy. Commerces — Kunivment shall be installed in accordance with the clearances from combustibles indicated on the name plate of the unit.	⁹ Suspend heating units in garages at	least 8 feet	: off the floor							

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(5) SPACE HEATERS. Space heaters shall comply with the following provisions:

(a) The burner of the appliance shall be enclosed with a metal housing so constructed that there will be no open flame and the burner housing shall be effectively guarded against personal contact. The arrangement shall be such that the shield will prevent any combustible material in the vicinity of the appliance from coming in contact with the flame or with the housing that encloses the burner. Oil-fired space heaters shall be equipped with a mechanical pressure atomizing burner; and

(b) Space heaters shall not be equipped with duct extensions beyond the vertical and horizontal limits of the metal enclosure.

(6) EQUIPMENT IN HAZARDOUS LOCATIONS. The types of heating and ventilating equipment that may be installed in hazardous locations (as defined in Article 500 of the National Electrical Code) are as follows:

(a) Listed low-pressure steam or hot water unit heaters and makeup air units; and

(b) Listed electric units.

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(7) FIREPLACES AND FIREPLACE STOVES. Masonry fireplaces, factorybuilt fireplaces and factory-built fireplace stoves shall be constructed and installed in accordance with the NFPA standard No. 211—Standard for Chimneys, Fireplaces and Vents.

(a) Masonry fireplaces. 1. Masonry fireplaces shall be constructed of solid masonry units, stone or reinforced portland or refractory cement concrete.

a. Where a lining of low-duty firebrick complying with the provisions of ASTM C64, or the equivalent, at least 2 inches thick laid-in fire-clay mortar complying with the provisions of ASTM C105, or the equivalent, or other approved lining is provided, the total thickness of back and sides, including the lining, shall be not less than 8 inches.

b. Where the lining described in subpar. a. is not provided, the thickness of back and sides shall be not less than 12 inches.

2. Steel fireplace units incorporating a firebox liner of not less than ¼ inch thick steel and an air chamber shall be installed with masonry to provide a total thickness at the back and sides of not less than 8 inches, not less than 4 inches of which shall be solid masonry.

3. Warm air ducts employed with steel fireplace units of the circulating air type shall be constructed of metal or masonry.

4. Fireplace hearth extensions of approved noncombustible material for all fireplaces shall be provided.

a. Where the fireplace opening is less than 6 square feet, the hearth extension shall extend at least 16 inches in front of, and at least 8 inches beyond each side of the fireplace opening.

b. Where the fireplace opening is 6 square feet or larger, the hearth extension shall extend at least 20 inches in front of, and at least 12 inches beyond each side of the fireplace opening.

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Standard No. 211 unless listed for installation at other clearances. Clearances shall be measured form the outer surface of the appliance or connector to the combustible material, disregarding any intervening protection applied to the combustible material. Appliances shall not be installed in alcoves or closets unless approved for such installations.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76; am. (2), Register, December, 1976, No. 252, eff. 1-1-77; am. (2), Register, January, 1980, No. 289, eff. 2-1-80; am. (4), Register, December, 1981, No. 312, eff. 1-1-82.

Type of Protection Applied to the combustible material unless otherwise apecified and covering all surfaces within the distance specified as the required clearance with no protection. Thicknesses are				W	/here requi	red clearanc	e with no	o protection i	s ³			
5 Thicknesses are minimum. Z		36 inches	at ya salat araa <u>katan</u> Malati sa Malati sa salat ya salat Malati sa salat ya salat ya	n de la constante da la consta Constante da la constante da la Constante da la constante da la	18 inches	<u>la de la Calificación</u> Calificación Calificación de Calificación Calificación de Calificación de Calificación de Calificación de Calificación de Ca	12	inches	9 inches		6 inches	<u>488.4.</u> 1993 - S. 1993 - S.
₩ ₩ ₩	Above	Sides & Rear	Chimney or Vent Connector	Above	Sides & Rear	Chimney or Vent Connector	Above	Sides & Rear	Chimney or Vent Connector	Above	Sides & Rear	Chimney or Vent Connecto
 (a) 0.013 in. (28 gage) sheet metal spaced out 1 in (b) 0.027 in (22 gage) sheet metal on 1. in mineral 	18	12	18	9	6	9	6	4	4	2	2	2
fiber batts reinforced with wire or equivalent	18	12	12	4	3	3	2	2	2	2	2	2
(c) 3 ¹ / ₂ in (actual) solid masonry spaced out 1 in. and attached as												
specified in s. Ind 53.36	18	18	18	9	9	9	6	6	4	2	2	2

TABLE 64.51-B

¹All clearances should be measured from the outer surface of the appliance to the combustible material disregarding any intervening protection applied to the generative material.

²This table is based upon Table 2-2.1 of NFPA Manual 89M-1976; however, all references to asbestos have been deleted to correspond with policy changes approved by NFPA.

³If a table heading is not available for a specific required clearance without protection, use the next highest heading.

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Footnotes to Table 64.51-A

1. Standard clearances may be reduced with protection for combustible material according to Table 64.51-B.

2. An appliance may be mounted on a combustible floor if the appliance is listed for installation on a combustible floor, or if the floor is protected according to Table 64.51-C.

3. Rooms which are large in comparison to the size of the appliance are those having a volume equal to at least 12 times the total volume of a furnace and at least 16 times the total volume of a boiler. If the actual ceiling height of a room is greater than 8 ft., the volume of a room shall be figured on the basis of a ceiling height of 8 ft.

4. The minimum dimension should be that necessray for servicing the appliance including access for cleaning and normal care, tube removal, etc.

5. For a listed oil, combination gas-oil, gas, or electric furnace this dimension may be 2 in. if the furnace limit control cannot be set higher than 250° F. or this dimension may be 1 in. if the limit control cannot be set higher than 200° F.

6. The dimension may be 6 in. for an automatically stoker-fired forced warm-air furnace equipped with 250° F. limit control and with barometric draft control operated by draft intensity and permanently set to limit draft to a maximum intensity of 0.13 in. water gauge.

7. To combustible material or metal cabinets. If the underside of such combustible material or metal cabinet is protected with asbestos millboard at least ¼ in. thick covered with sheet metal of not less than No. 28 gauge the distance may be not less than 24 in.

8. If the appliance is encased in brick, the 18 in. clearance above and at sides and rear may be reduced to not less than 12 in.

9. Clearance above charging door shall be not less than 48 in.

10. Residential-type appliances are fuel-burning and electric appliances (except high pressure boilers for generating steam in excess of 15 psig or for heating water in excess of 250° F. or above 160 psig), for heating building spaces having a volume of not more than 25,000 cubic feet, and other heat-producing appliances of the type mainly used in residences, but which may be used in other buildings, such as cooking stoves and ranges, clothes dryers, fireplace stoves, domestic incinerators, laundry stoves, water heaters and heat pumps.

11. Building heating appliances are fuel-burning and electric boilers, operating at not over 50 psig pressure, central furnaces, and heaters intended primarily for heating spaces having a volume exceeding 250,000 cubic feet.

12. A low heat appliance such as a commercial cooking range, bake oven, drying and curing appliance, and other process appliances in which materials are heated or melted at temperatures (excluding flue-gas temperatures) not exceeding 600° F.

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Standard Installation Clearances, Inches, for Heat Producing Appliances (See Note 1.)

These clearances apply unless otherwise shown on listed appliances. Appliances shall not be installed in alcoves or closets unless so listed. For installation on combustible floors, see note 2.

Table 64.51-A

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Air Conditioning

d ng e			and a start of the st			APPLIANCE		
, Jecember, 1981, No. 312 3 and heating, ventilating conditioning code		Residential- Type Appliances ¹¹ For Installation In Which Are Large (See Note 3)		Above Top of Casing or Appliance	From Top and Sides of Warm-Air Bonnet or Plenum	Prom Front See Note 4	From Back	From Sides
le en 1,	i	Boilers & Water Heaters	Automatic Oil					
Lilat		Steam Boilers-15 psi Water Boilers-250° F.	or Comb. Gas-Oil	6		24	6	6
ដី យ	,	Water Heaters-200° F.	Automatic Gas	6	- 19 - - - 19 18	18	6	6
57 I N		All Water Walled or	Solid	6		48	6	6
		Jacketed	Electric	6		19	6	6
		Furnaces-Central	Automatic Oil or	65	65	24	6	6
		Gravity, Upflow, Downflow, Horizontal and Duct.	Comb. Gas-Oil Automatic Gas	65	65	19	6	6
		Warm-Air250* F. Max.	Solid	186	186	48	18	18
		Walm Hit 200 FF Hax.	Electric	65	65	18	6	6
			Automatic Oil					
		Furnaces-Floor For Mounting in Combustible	or Comb. Gas-Oil	36		12	12	12
		Floors	Automatic Gas	36		12	12	12
			Electric	36		12	12	12
		Heat Exchanger Steam-15 psi Max. Hot Water-250° F. Max.		1	1. 1. W.C	1	1	1
		Room Heaters	n and an and a start of the start					
		Circulating Type	Oil or Solid	36	14 <u>- 1</u> 2	24	12	12
		Vented or Unvented	Gas	36	- 1997 1997 -	24	12	12
			Oil or Solid	36	- 20 20 (2)	36	36	36
			Gas	36	//	36	18	18
		Radiant or Other Type	Gas With Double		411			
		Vented or Unvented	Metal or Ceramic Back	36	د ایر ۱۹۹۹ - ۱۹۹۹ - ۱۹	36	12 .	18
		Radiators						
		Steam or Hot Water	Gas	36		6	6	6
				See Note 7				Firing Op Side Si

	Oil	30			9	24	18
Ranges-Cooking Stoves	Gas	30			б	6	6
	SolidClay	30			24	24	18
	Lined Firepot		10 A				
Vented	Solid	30			36	36	18
or	Unlined Firepot						
Unvented	Electric	30			6	6	e
Clothes Dryers	Gas	6		24	6	6	
Listed	Electric	6		24	ō	: 0	
Incinerators	Electric	and the second s		24		<u> </u>	····
		See Note 10	ka da a	· · · · ·			
Residential Type		36		48	36	36	
Construction of the second			<u> </u>	APPLIANCE			
Building Heating ¹² and Low Heat ¹³		Above	From Top		From	From	
Appliances		Top of	and Sides		Back	Sides	
		Casing	of.	From			
Any and All Physical Sizes		or	Warm-Air	Front	See	See	
Except as Noted		Appliance	Bonnet or		Note	Note	
Except as noted		See Note 8	Plenum		8	8	
Boilers & Water Heaters		JEC NULE 0	Frendan		· · · ·		
					1		
100 cu ft or less			1				
Any psi Steam	All Fuels	18		48	18	18	
50 psi or less					1		
Any Size	All Fuels	18		48	18	18	
Unit Heaters	and the second	17 July 19	State of the second sec	1.1.		11	
Floor Mounted or	Steam or		그는 사람들과 말				
Suspended-Any Size	Hot Water	1	1999 - <u>24</u> 03,000		1 1	1	
Suspended-	011 or	the state of the fi	11. AU-11			·	
100 cu ft or less	Comb. Gas-Oil	6		24	18	18	
	COND. GAN-ULI	4 1 1 1 1 1		24		10	
Suspended	والمتعارية المتعادية والمتعادية والمتعادية والمتعادية والمتعاد المتعاد المتعادية والمتعادية والمتعادية والمتعا	6	and the second second	10	1		
100 cu ft or less	Gas	P	-	18	18	18	
Suspended-		1					
Over 100 cu ft	All Fuels	18		48	18	18	
Floor Mounted-Any Size	All Fuels	18		48	18	18	
RangesRestaurant Type							
Floor Mounted	All Fuels	48	 stations	48	18	18	
Other Low-Heat Appliances	1 v.						
Floor Mounted or Suspended	All Fuels	18	18	48	18	18	
		1		APPLIANCE	4		
		Above	From Top		From	From	-
Commercial Industrial	Themes of the State of the second	Top of	and Sides		Back	Sides	
		Casing	of	From	Back	arnes	
Medium-Heat Appliance	es				[[-	
		or	Warm-Air	Front	See	See	
		Appliance	Bonnet or		Note	Note	
		See Note 9	Plenum		9	9	_
Boilers & Water Heaters		1					
Over 50 psi					1 1		
Over 100 cu ft	All Fuels	48		96	36	36	
Other MedHeat Industrial							
Appliances)	1 : 1				
All Sizes	All Fuels	48	36	96	36	36	
Incinerators	ALL FUELS						
		48		96		36	
All Sizes		48		96	36	36	
Industrial Type			1 1		t l		
High-Heat Appliance:	5	L			L		
High-Heat Industrial Appliances		1	122				
		180	and the <u>set of set of the</u>	360	120	120	

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TABLE 64.51-C

Appliance Leg Length	Protection Required
6 inches or more	No. 24 U.S. Gage (0.025 in.) sheet metal
Less than 6 inches	No. 24 U.S. Gage (0.025 in.) sheet metal over 4 inches of hollow masonry laid to provide air circulation through the masonry.

¹This protection is required over floors containing combustible construction, including noncombustible flooring over combustible joists. The amount or type of floor protection depends on the appliance leg length. The floor protection shall extend at least 12 inches to the sides and rear of the appliance and 18 inches beyond sides having a door or similar opening.

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(1) In a difference wave anythicker is completely publicly publicly to the state of the set of t

And Coloris in the analysis of and agains globary (4), the minimum (4), the figure matrix (4) by figure (ing), well for experimentations and an original figure matrix (4) and (4) and (4) and (4) are figure (4). Interval (1) production (1) and (2) and (2) and (2) and (2) and (2) and (2) and (1) and (2) and

of The animatic terminant in a statistican particular of the second state of the secon

TABLE 64.51-D

CHIMNEY CONNECTOR AND VENT CONNECTOR CLEAR-ANCES FROM COMBUSTIBLE MATERIALS (See Note 3)

Description of Appliance	Minimum Clearance (Inches)
Single-Wall Metal Pipe Connectors	
Gas Appliances Without Draft Hoods	18
Electric, Gas, and Oil Incinerators	18
Oil- and Solid-fuel Appliances	18
Unlisted Gas Appliances With Draft Hoods	9
Boilers and Furnaces Equipped With Listed Gas	ijste stalije en en
Burners and With Draft Hoods	9
Oil Appliances Listed as Suitable for Use with Type	
L Venting Systems, but Only When Connected to	
Chimneys	9
Listed Gas Appliances with Draft Hoods (See Note	~ 2 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전 전
2)	6
Type L Vent Piping Connectors	
Gas Appliances Without Draft Hoods	9
Electric, Gas and Oil Incinerators	9
Oil- and Solid-Fuel Appliances	9
Unlisted Gas Appliances With Draft Hoods	6
Boilers and Furnaces Equipped With Listed Gas	
Burners and With Draft Hoods	6
Oil Appliances Listed as Suitable for Use With Type	
L Vents	(See Note 1
Listed Gas Appliances With Draft Hoods	(See Note 2
Type B Gas Vent Piping Connectors	
Listed Gas Appliances With Draft Hoods	(See Note 2)

¹ If listed type L venting system piping is used, the clearance may be in accordance with the venting system listed.

² If listed type B or type L venting system piping is used, the clearance may be in accordance with the venting system listing.

³ The clearances from connectors to combustible materials may be reduced if the combustible material is protected in accordance with Table 64.51-B or s. Ind 64.50 (1) (b).

Ind 64.52 Maintenance and operation. (1) MAINTENANCE. All heating, ventilating, exhaust and air conditioning systems shall be maintained in good working order and shall be kept clean and sanitary. Chimneys or vents and connectors serving solid-fuel burning appliances shall be cleaned and inspected for damage annually. Chimneys and vents, which have been subjected to a chimney fire, shall not be reused until inspected and approved by the department or authorized deputy.

(2) OPERATION. All heating, ventilating and exhaust systems shall be operated to satisfy the requirements of this chapter during periods the building is occupied.

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(3) INSTRUCTIONS. The designer or installer shall provide the owner with written instructions for the operation and maintenance of the system and equipment.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76; am. (1), Register, December, 1981, No. 312, eff. 1-1-82.

Ind 64.53 Final test required. The designer, installer or recognized balancing agency shall be responsible for the testing and balancing of every heating, ventilating and air conditioning system.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76.

PART VIII—OCCUPANCY REQUIREMENTS

Ind 64.54 Factories, office and mercantile buildings. (1) SCOPE. This classification shall include all places of employment, mercantile buildings, retail establishments where goods and commodities are bought and sold, and places where not more than 100 persons assemble for worship, recreation, entertainment or dining purposes.

Note: For mall corridors of enclosed mall shopping centers, see s. Ind 64.05, Table 1.

(2) VENTILATION. The air movement, supply and distribution for all occupancies in this class shall conform to the requirements of s. Ind 64.05, Table 1, except that natural ventilation or mechanical ventilation need not be provided in warehouses and cold storage buildings.

(3) INDUSTRIAL EXHAUST SYSTEM. (a) Contaminants. Industrial exhaust systems shall be installed and operated to remove harmful contaminants in conformance with chs. Ind 1000-2000—Safety and Health Code. Wis. Adm. Code.

(b) Makeup air. A volume of outside air shall be supplied to replace the air exhausted if the total volume of air exhausted exceeds one air change per hour. The quantity of makeup air shall equal at least 90% of the air exhausted.

(c) Connections. Connections between industrial exhaust systems that convey different materials, the combination of which may produce explosive, heat-generating, corrosive, toxic, or otherwise dangerous mixtures, shall be prohibited.

(4) LOCKER ROOMS. Locker rooms used in places of industrial employment shall be provided with outside air. See s. Ind 64.05, Table 1.

Note: Exhaust air from locker rooms may be directed through the adjoining toilet room or shower room.

(5) FIRST AID REST ROOMS IN PLACES OF EMPLOYMENT. Ventilation shall be provided for all areas of this class to conform to the requirements of s. Ind 64.05, Table 1.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76.

Ind 64.55 Theaters and places of assembly. (1) SCOPE. This classification shall include auditoriums, arenas, armories, assembly halls, banquet halls, billiard rooms, bowling alleys, cafeterias, club rooms, dance halls, dining rooms, gymnasiums, lecture halls, lodge halls, playrooms, restaurants, school auditoriums, Sunday schools and places of worship,

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funeral home chapels, parochial schools, convents, indoor skating rinks, and theaters which accommodate more than 100 persons for entertainment, recreation, worship, or dining purposes.

Note: For areas that will accommodate less than 100 persons, see s. Ind 64.54.

(2) VENTILATION. The air movement, supply and distribution for all occupancies under this classification shall conform to the requirements of s. Ind 64.05, Table 1.

(3) ALTERNATE SERVICE AND CAPACITY. Heating and ventilating systems installed in places of worship, Sunday schools, so-called community buildings and lodge halls may be arranged for selective delivery of the entire service to either the first floor area or to the basement floor area provided these areas are not used simultaneously.

(4) STAGES. The stage in any theater or assembly hall, for which a fire curtain is required, shall be supplied with sufficient air or other means to equalize the pressure to avoid deflecting the curtain.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76.

Ind 64.56 Schools and other places of instruction. (1) SCOPE. This classification shall apply to all public and private schools, colleges, universities, academies, seminaries, libraries, museums, art galleries, all places used for vocational instruction and research such as laboratories, shops, science rooms, and all parts of buildings used for instructional purposes.

(2) VENTILATION. The air movement, supply and distribution for all occupancies under this classification shall conform to the requirements of s. Ind 64.05, Table 1. For corridors provided with lockers, the air movement shall be not less than 10 cubic feet per minute per lineal foot of corridor. This air supply shall be accomplished by means of air inlets admitting air from adjacent classrooms or by a direct tempered air supply.

Note: This rule does not apply to corridors furnished with coat hooks.

(3) EXHAUST SYSTEMS AND HEAT RECOVERY. (a) An exhaust system, as specified in s. Ind 64.54 (3), shall be provided for all equipment and processes that create dust, fumes, vapors and gases injurious to health.

(b) Exhaust systems whose operation is more than 3600 hours per year shall be equipped with heat recovery devices to reduce the energy consumption in the building.

1. Exception. a. Systems exhausting explosive materials, such as perchloric acid need not be so equipped.

b. Fan systems exhausting 250 CFM or less need not be so equipped.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76; am. (3), Register, December, 1976, No. 252, eff. 1-1-77.; am. (3), Register, December, 1981, No. 312, eff. 1-1-82.

Ind 64.57 Hospitals and nursing homes. (1) SCOPE. This classification shall include hospitals, nursing homes, public health centers and

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treatment centers where medical services are provided for treatment and care of "bedfast patients."

Note #1: A "bedfast patient" is a person who is normally confined to a bed or chair.

Note #2: For additional requirements, refer to Wis. administrative codes of the state department of health and social services.

(2) VENTILATION. The air movement, supply and distribution shall conform to the requirements of section Ind 64.05, Table 1, and the following:

Note: The department of health and social services requires a positive pressure relationship, with respect to adjacent areas, in corridors, operating rooms, delivery rooms, nurseries, day room areas, laboratories with media transfer, and nurses stations which are located in corridors.

(a) Exhaust ventilation shall be provided on the basis of 2 cubic feet per minute for each square foot of floor area from such rooms as baths, laboratories, laundries, anesthetic storage, bedpan, sterilizing, soiled utility, soiled linen, and janitor closets.

(b) The heating and ventilating system serving such rooms as operating, anesthesia, recovery, labor, delivery, nursery, isolation, therapy, and autopsy shall satisfy the following conditions:

1. A minimum air movement of not less than 6 air changes per hour.

2. Outside air of not less than 6 air changes per hour shall be provided.

3. The recirculation of air is not permitted in autopsy rooms.

4. Recirculation of air shall only be permitted within the system serving an individual room.

5. Mechanical exhaust shall be provided.

6. The relative humidity in rooms where an esthetic gases are used shall be maintained at not less than 50%.

(c) Private rooms, semi-private wards, day rooms, and nurses stations shall be ventilated in accordance with the requirements of section Ind 64.05, Table 1, unless an openable sash area has been provided and the content of the space is in excess of 400 cubic feet per occupant.

Note: See sections Ind 57.17 and 57.19.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76; r. (2) (d), Register, Janaury, 1980, No. 289, eff. 2-1-80.

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Ind 64.58 Penal institutions and places of detention. (1) SCOPE. This classification shall include corridors and areas of compulsory occupancy in penal institutions, mental hospitals and other places of detention.

(2) VENTILATION. The air movement, supply and distribution for all areas of this class shall conform to the requirements of s. Ind 64.05, Table 1.

(3) OVERNIGHT LOCK-UPS. Where cells are provided for not more than 6 occupants for the purpose of overnight detention only, exhaust ventilation shall be provided on the basis of 6 air changes per hour for the occupied area.

History: Cr. Register, December, 1975, No.240, eff. 1-1-76; am. (2), Register, December, 1981, No. 312, eff. 1-1-82.

Ind 64.59 Residential occupancies. (1) SCOPE. This classification shall include all apartments, row houses, rooming houses, hotels, motels, dormitories, and all other places of abode.

Note: See s. Ind 51.01 (102a) for definition of "place of abode."

(2) VENTILATION. The air movement, supply and distribution for all areas of this class shall conform to the requirements of s. Ind 64.05, Table 1.

(a) *Exception*. For motel or hotel sleeping rooms without openable outside windows and facing naturally lighted pool or recreation areas, see ss. Ind 52.02 (1) (b) and 57.13 (2).

(3) RETURN AIR DUCTS. Unlined wood joists and stud spaces will be permitted to be used as return air ducts in individual living units provided with individual heating and ventilating systems.

History: Cr. Register, December, 1975, No. 240, eff. 1-1-76; am. (3), Register, December, 1976, No. 252, eff. 1-1-77; cr. (2) (a), Register, May, 1980, No. 293, eff. 6-1-80.

Ind 64.60 Day care facilities. (1) SCOPE. This classification shall include all public and private day care centers accommodating more than 4 children, including all buildings or parts of buildings used as child day care facilities.

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