WSR 23-23-105
PERMANENT RULES
BUILDING CODE COUNCIL

[Filed November 15, 2023, 10:01 a.m., effective March 16, 2024]

Effective Date of Rule: March 16, 2024.

Purpose: Reconciling state amendments with section renumbering and model code modifications in the 2021 International Mechanical Code and International Fuel Gas Code; correcting errors and omissions.

Citation of Rules Affected by this Order: Amending eight sections in chapter 51-52 WAC.

Statutory Authority for Adoption: RCW 19.27.031, 19.27.074.

Other Authority: RCW 19.27.031, 19.27.074.

Adopted under notice filed as WSR 23-15-016 on July 7, 2023.

Changes Other than Editing from Proposed to Adopted Version:

WAC	Section	Change	Rationale/Discussion
51-52-008	Implementation	Implementation date is changed from October 29, 2023, to March 15, 2024.	The state building code council voted to delay implementation of all codes on September 15, 2023.
51-52-0403	403.3.2.4	Specifically declares section 403.3.2.4 "not adopted."	This section is in direct conflict with the state amendment in section 403.4.5. The adoption of section 403.4.5 was intended to replace the text in section 403.3.2.4; however, 403.3.2.4 was inadvertently missed during the code adoption process. The amendment corrects an oversight and clarifies that section 403.3.2.4 is not adopted in Washington state.
	403.4.3	In explanation of variable "Qr" reference to section "403.4.1" is corrected to "403.4.2."	This change is necessary to correct an error in the original filing.
	403.4.4.1 Exception #2	Changes reference from "403.3.6" to "403.4.6."	This change is necessary to correct an error in the original filing.
	403.4.5 #3	Changes the word "operating" to "operate."	Corrects incorrect grammar clarifying the intent of the amendment.

A final cost-benefit analysis is available by contacting Dustin Curb, 1500 Jefferson Street S.E., Olympia, WA 98504, phone 360-972-4158, email dustin.curb@des.wa.gov, website https://www.sbcc.wa.gov/.

Number of Sections Adopted in Order to Comply with Federal Statute: New 0, Amended 0, Repealed 0; Federal Rules or Standards: New 0, Amended 0, Repealed 0; or Recently Enacted State Statutes: New 0, Amended 0, Repealed 0.

Number of Sections Adopted at the Request of a Nongovernmental Entity: New 0, Amended 0, Repealed 0.

Number of Sections Adopted on the Agency's own Initiative: New 0, Amended 0, Repealed 0.

Number of Sections Adopted in Order to Clarify, Streamline, or Reform Agency Procedures: New 0, Amended 8, Repealed 0.

Number of Sections Adopted using Negotiated Rule Making: New 0, Amended 0, Repealed 0; Pilot Rule Making: New 0, Amended 0, Repealed 0; or Other Alternative Rule Making: New 0, Amended 8, Repealed 0.

Date Adopted: October 20, 2023.

Tony Doan
Council Chair

OTS-4722.4

AMENDATORY SECTION (Amending WSR 23-02-055, 23-12-106, and 23-20-025, filed 1/3/23, 6/7/23, and 9/25/23, effective 3/15/24)

WAC 51-52-003 International Mechanical Code. The 2021 edition of the *International Mechanical Code* published by the International Code ((~~Conference~~)) Council is hereby adopted by reference with the exceptions noted in this chapter of the Washington Administrative Code (WAC).

AMENDATORY SECTION (Amending WSR 23-02-055, 23-12-106, and 23-20-025, filed 1/3/23, 6/7/23, and 9/25/23, effective 3/15/24)

WAC 51-52-008 Implementation. The International Mechanical Code adopted by chapter 51-52 WAC shall become effective in all counties and cities of this state on ((~~July 1, 2023~~)) March 15, 2024.

AMENDATORY SECTION (Amending WSR 23-02-055, 23-12-106, and 23-20-025, filed 1/3/23, 6/7/23, and 9/25/23, effective 3/15/24)

WAC 51-52-0401 Section 401—General.

401.2 Ventilation required. Every occupied space other than enclosed parking garages and buildings used for repair of automobiles shall be ventilated in accordance with Section 401.2.1, 401.2.2 or 401.2.3. Enclosed parking garages and buildings used for repair of automobiles shall be ventilated by mechanical means in accordance with Sections 403 and 404.

401.2.1 Group R occupancies. Ventilation in Group R occupancies shall be provided in accordance with Section 403.4.

401.2.2 Ambulatory care facilities and Group I-2 occupancies. Ambulatory care facilities and Group I-2 occupancies shall be ventilated by mechanical means in accordance with Section 407.

401.2.3 All other occupancies. Ventilation in all other occupancies shall be provided by natural means in accordance with Section 402 or by mechanical means in accordance with Sections 403.1 to 403.7.

401.3 When required. Group R occupancies shall be vented continuously or intermittently in accordance with Section 403.4. Ventilation in all other occupancies shall be provided during the periods that the room or space is occupied.

401.4 Intake opening location. Air intake openings shall comply with all of the following:

1. Intake openings shall be located not less than 10 feet (3048 mm) from lot lines or buildings on the same lot. Lot lines shall not be defined as a separation from a street or public way.

2. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) horizontally from any hazardous or noxious contaminant source, such as vents, streets, alleys,

parking lots, and loading docks, except as specified in Item 3 or Section 501.3.1. Outdoor air intake openings shall be permitted to be located less than 10 feet (3048 mm) horizontally from streets, alleys, parking garage entries, parking lots, and loading docks provided that the openings are located not less than 25 feet (7620 mm) vertically above such locations. Where openings front on a street or public way, the distance shall be measured from the closest edge of the street or public way.

EXCEPTIONS: 1. Intake air openings providing less than 500 cfm of outdoor air to Group R occupancies are permitted to be located less than 10 feet (3048 mm) horizontally from parking lots provided that the openings are not less than 15 feet (4572 mm) vertically above the parking lot.
2. Intake air openings providing less than 500 cfm of outdoor air to Group R occupancies are permitted to be located less than 10 feet (3048 mm) horizontally from parking lots provided that the openings are not less than 15 feet (4572 mm) vertically above the clear height for vehicles in the parking garage.

3. Intake openings shall be located not less than 3 feet (914 mm) below contaminant sources where such sources are located within 10 feet (3048 mm) of the opening. Separation is not required between intake air openings, operable openings, and living space exhaust air openings of an individual dwelling unit or sleeping unit where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions. For these combined terminations, the exhaust air concentration within the intake airflow shall not exceed 10 percent as established by the manufacturer, in accordance with ASHRAE 62.2 Section 6.8, Exception 4. A minimum of three feet (914 mm) separation shall be maintained between other environmental air exhaust outlets and other dwelling or sleeping unit factory-built intake/exhaust combination termination fittings.

4. Intake openings on structures in flood hazard areas shall be at or above the elevation required by Section 1612 of the *International Building Code* for utilities and attendant equipment.

EXCEPTION: Enclosed parking garage and repair garage ventilation air intakes are permitted to be located less than 10 feet horizontally from or 25 feet vertically above a street, alley, parking lot, and loading dock.

401.7 Testing and balancing. At the discretion of the building official, flow testing may be required to verify that the mechanical system(s) satisfies the requirements of this chapter. Flow testing may be performed using flow hood measuring at the intake or exhaust points of the system, in-line pitot tube, or pitot-traverse type measurement systems in the duct, short term tracer gas measurements, or other means approved by the code official.

AMENDATORY SECTION (Amending WSR 23-02-055, 23-12-106, and 23-20-025, filed 1/3/23, 6/7/23, and 9/25/23, effective 3/15/24)

WAC 51-52-0403 Section 403—Mechanical ventilation.

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

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

EXCEPTIONS: 1. Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of *outdoor air* ventilation determined in accordance with Section 403.3, the minimum required rate of *outdoor air* shall be reduced in accordance with such engineered system design.
2. Alternate systems designed in accordance with ASHRAE Standard 62.1 Section 6.2, Ventilation Rate Procedure, shall be permitted.

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.

2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where 10 percent or more of the resulting supply airstream consists of air recirculated from these spaces. The design and installation of dehumidification systems shall comply with ANSI/ACCA 10 Manual SPS.

3. Where mechanical exhaust is required by Note b in Table 403.3.1.1, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.1.1.

4. Where mechanical exhaust is required by Note g in Table 403.3.1.1, mechanical exhaust is required and recirculation from such spaces is prohibited where more than 10 percent of the resulting supply airstream consists of air recirculated from these spaces. Recirculation of air that is contained completely within such spaces shall not be prohibited.

403.3 Outdoor air and local exhaust airflow rates. Group R occupancies shall be provided with outdoor air and local exhaust in accordance with Section 403.4. All other buildings intended to be occupied shall be provided with outdoor air and local exhaust in accordance with Section 403.3.1.

403.3.1.1 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. In each occupiable space, the ventilation system shall be designed to deliver the required rate of outdoor airflow to the breathing zone. Outdoor air shall be supplied directly to each occupiable space from an air handling unit through a fully ducted path or ducted to within 12 inches of the return air opening of a fan-powered terminal unit used to transfer the outdoor air to the occupiable space. 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 403.3.1.1. Ventilation rates for occupancies not represented in Table 403.3.1.1 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system, including transfer fan-powered terminal units, shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

With the exception of smoking lounges, the ventilation rates in Table 403.3.1.1 are based on the absence of smoking in occupiable spaces. Where smoking is anticipated in a space other than a smoking lounge, the ventilation system serving the space shall be designed to provide ventilation over and above that required by Table 403.3.1.1 in accordance with accepted engineering practice.

EXCEPTION: Where occupancy density is known and documented in the plans, the outside air rate may be based on the design occupant density. Under no circumstance shall the occupancies used result in outside air less than one-half that resulting from application of Table 403.3.1.1 estimated maximum occupancy rates.

Table 403.3.1.1

REQUIRED OUTDOOR VENTILATION AIR

Occupancy Classification	Occupant Density #/1000 ft^{2a}	People Outdoor Airflow Rate in Breathing Zone R_p cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Exhaust Airflow Rate cfm/ft^{2a}
Correctional facilities				
Booking/waiting	50	7.5	0.06	—
Cells				
Without plumbing fixtures	25	5	0.12	—
With plumbing fixtures[g]	25	5	0.12	1.0
Day room	30	5	0.06	—
Dining halls	—	—	—	—
(see "Food and beverage service")	—	—	—	—
Guard stations	15	5	0.06	—
Dry cleaners, laundries				
Coin-operated dry cleaner	20	15	—	—
Coin-operated laundries	20	7.5	0.12	—
Commercial dry cleaner	30	30	—	—
Commercial laundry	10	5	0.12	—
Storage, pick up	30	7.5	0.12	—
Education				
Art classroom[g]	20	10	0.18	0.7
Auditoriums	150	5	0.06	—
Classrooms (ages 5 through 8)	25	10	0.12	—
Classrooms (age 9 plus)	35	10	0.12	—
Computer lab	25	10	0.12	—
Corridors (see "Public spaces")	—	—	—	—
Day care (through age 4)	25	10	0.18	—
Lecture classroom	65	7.5	0.06	—
Lecture hall (fixed seats)	150	7.5	0.06	—
Locker/dressing rooms[g]	—	—	—	0.25
Media center	25	10	0.12	—
Multiuse assembly	100	7.5	0.06	—
Music/theater/dance	35	10	0.06	—
Science laboratories[g]	25	10	0.18	1.0
Smoking lounges[b]	70	60	—	—
Sports locker rooms[g]	—	—	—	0.5
Wood/metal shops[g]	20	10	0.18	0.5
Food and beverage service				
Bars, cocktail lounges	100	7.5	0.18	—
Cafeteria, fast food	100	7.5	0.18	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking)[b]	20	7.5	0.12	0.7
Hotels, motels, resorts, and dormitories				
Bathrooms/toilets—private[g]	—	—	—	25/50[f]
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping area	20	5	0.06	—
Gambling casinos	120	7.5	0.18	—
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	50	0.06	—

Occupancy Classification	Occupant Density #/1000 ft^{2a}	People Outdoor Airflow Rate in Breathing Zone R_p cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Exhaust Airflow Rate cfm/ft^{2a}
Offices				
Conference rooms	50	5	0.06	—
Kitchenettes[k]	25	5	0.06	0.30
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Main entry lobbies	10	5	0.06	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Kitchens[b]				See Table 403.4.7
Living areas[c]		See Table 403.4.2	—	—
Toilet rooms and bathrooms[g]	—	—		See Table 403.4.7
Public spaces				
Corridors serving other than Group R occupancies	—	—	0.06	—
Corridors serving Group R dwelling or sleeping units with whole house exhaust system	—	—	0.12	—
Corridors serving Group R dwelling or sleeping units with other than whole house exhaust system	—	—	0.06	—
Courtrooms	70	5	0.06	—
Elevator car	—	—	—	((1)) 1.0
Elevator lobbies in parking garage	—	—	1.0	—
Legislative chambers	50	5	0.06	—
Libraries	10	5	0.12	—
Museums (children's)	40	7.5	0.12	—
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—
Shower room (per showerhead)[g]	—	—	—	50/20[f]
Smoking lounges[b]	70	60	—	—
Toilet rooms—Public[g]	—	—	—	50/70[e]
Retail stores, sales floors, and showroom floors				
Dressing rooms	—	—	—	0.25
Mall common areas	40	7.5	0.06	—
Sales	15	7.5	0.12	—
Shipping and receiving	2	10	0.12	—
Smoking lounges[b]	70	60	—	—
Storage rooms	—	—	0.12	—
Warehouses (see "Storage")	—	10	0.06	—
Specialty shops				
Automotive motor fuel-dispensing stations[b]	—	—	—	1.5
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Embalming rooms[b]	—	—	—	2.0
Nail salons[b,h]	25	20	0.12	0.6
Pet shops (animal areas)[b]	10	7.5	0.18	0.9
Supermarkets	8	7.5	0.06	—
Sports and amusement				
Disco/dance floors	100	20	0.06	—
Bowling alleys (seating areas)	40	10	0.12	—

Occupancy Classification	Occupant Density #/1000 ft^{2a}	People Outdoor Airflow Rate in Breathing Zone R_p cfm/Person	Area Outdoor Airflow Rate in Breathing Zone R_a cfm/ft^{2a}	Exhaust Airflow Rate cfm/ft^{2a}
Game arcades	20	7.5	0.18	—
Ice arenas, without combustion engines[j]	—	—	0.30	0.5
Gym, stadium, arena (play area)[j]	((—)) 7	((—)) 20	((~~0.30~~)) 0.18	—
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Storage				
Janitor closets, trash rooms, recycling rooms	—	—	—	1.0
Repair garages, enclosed parking garage[b, d]	—	—	—	0.75
Storage rooms, chemical	—	—	—	1.5
Warehouses	—	—	0.06	—
Theaters				
Auditoriums (see "Education")	—	—	—	—
Lobbies	150	5	0.06	—
Stages, studios	70	10	0.06	—
Ticket booths	60	5	0.06	—
Transportation				
Platforms	100	7.5	0.06	—
Transportation waiting	100	7.5	0.06	—
Workrooms				
Bank vaults/safe deposit	5	5	0.06	—
Darkrooms	—	—	—	1.0
Copy, printing rooms	4	5	0.06	0.5
Freezer and refrigerated spaces (<50°F)	0	10	0	0
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Computer (without printing)	4	5	0.06	—

For SI: 1 cubic foot per minute = 0.0004719 m^3/s, 1 ton = 908 kg, 1 cubic foot per minutes per square foot = 0.00508 $m^3/(s \cdot m^2)$, °C = [(°F) -32]/1.8, 1 square foot - 0.0929 m^2.

a. Based upon *net occupiable floor area*.
b. Mechanical exhaust required and the recirculation of air from such spaces is prohibited. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Item 3).
c. Spaces unheated or maintained below 50°F are not covered by these requirements unless the occupancy is continuous.
d. Ventilation systems in enclosed parking garages shall comply with Section 404.
e. Rates are per water closet or urinal. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
f. Rates are per room unless otherwise indicated. The higher rate shall be provided where the exhaust system is designed to operate intermittently. The lower rate shall be permitted only where the exhaust system is designed to operate continuously while occupied.
g. Mechanical exhaust is required and recirculation from such spaces is prohibited. For occupancies other than science laboratories, where there is a wheel-type energy recovery ventilation (ERV) unit in the exhaust system design, the volume of air leaked from the exhaust airstream into the outdoor airstream within the ERV shall be less than 10 percent of the outdoor air volume. Recirculation of air that is contained completely within such spaces shall not be prohibited (see Section 403.2.1, Items 2 and 4).
h. For nail salons, each manicure and pedicure station shall be provided with a *source capture system* capable of exhausting not less than 50 cfm per station. Exhaust inlets shall be located in accordance with Section 502.20. Where one or more required source capture systems operate continuously during occupancy, the exhaust rate from such systems shall be permitted to be applied to the exhaust flow rate required by Table 403.3.1.1 for the nail salon.
i. Reserved.
j. When combustion equipment is intended to be used on the playing surface, additional dilution ventilation and/or source control shall be provided.
k. Kitchenettes require exhaust when they contain a domestic cooking appliance range or oven that is installed in accordance with Table 507.1.2. Kitchenettes that only contain a microwave cooking appliance are not required to have exhaust. A kitchenette may not contain commercial cooking appliances that require Type I or Type II exhaust as these occupancies are required to be exhausted to the kitchen category in Table 403.3.1.1.

403.3.1.1.2.3 Multiple zone recirculating systems. For ventilation systems wherein one or more air handlers supply a mixture of outdoor air and recirculated air to more than one ventilation zone, the out-

door air intake flow (V_{ot}) shall be determined in accordance with Sections 403.3.1.1.2.3.1 through 403.3.1.1.2.3.4.

403.3.1.1.2.3.1 Uncorrected outdoor air intake. The uncorrected outdoor air intake flow (V_{ot}) shall be determined in accordance with Equation 4-5.

$$V_{ou} = D\sum_{all\ zones}(R_p \times P_z) + \sum_{all\ zones}(R_a \times A_z) \quad \textbf{(Equation 4-5)}$$

403.3.1.1.2.3.1.1 Occupant diversity. The occupant diversity ratio (D) shall be determined in accordance with Equation 4-6 to account for variations in population within the ventilation zones served by the system.

$$D = P_s/\sum_{all\ zones}P_z \quad \textbf{(Equation 4-6)}$$

where:

P_s = System population: The total population in the area served by the system.

EXCEPTION: Alternative methods to account for occupant diversity shall be permitted, provided the resulting V_{ou} value is no less than that determined using Equation 4-5.

403.3.1.1.2.3.1.2 Design system population. Design system population (P_s) shall equal the largest (peak) number of people expected to occupy all ventilation zones served by the ventilation system during use.

Note: Design system population is always equal to or less than the sum of design zone population for all zones in the area served by the system because all zones may or may not be simultaneously occupied at design population.

403.3.1.1.2.3.2 System ventilation efficiency. The system ventilation efficiency (E_v) shall be determined in accordance with Section 403.3.1.1.2.3.3 for the Simplified Procedure or Appendix A of ASHRAE 62.1 for the Alternative Procedure.

Note: These procedures also establish zone minimum primary airflow rates for VAV systems.

403.3.1.1.2.3.3 Simplified procedure.

403.3.1.1.2.3.3.1 System ventilation efficiency. System ventilation efficiency (E_v) shall be determined in accordance with Equation 4-6a or 4-6b.

$$E_v = 0.88 \times D + 0.22 \text{ for } D < 0.60 \quad \textbf{(Equation 4-6a)}$$

$$E_v = 0.75 \text{ for } D \geq 0.60 \quad \textbf{(Equation 4-6b)}$$

403.3.1.1.2.3.3.2 Zone minimum primary airflow. For each zone, the minimum primary airflow ($V_{pz\text{-}min}$) shall be determined in accordance with Equation 4-7.

$$V_{pz\text{-}min} = V_{oz} \times 1.5 \quad \textbf{(Equation 4-7)}$$

403.3.1.1.2.3.4 Outdoor air intake. The design outdoor air intake flow (V_{ot}) shall be determined in accordance with Equation 4-8.

$$V_{ot} = V_{ou}/E_v \quad \textbf{(Equation 4-8)}$$

403.3.2 Group R-2, R-3 and R-4 occupancies. This section is not adopted. See Section 403.4.

403.3.2.1 Outdoor air for dwelling units. This section is not adopted.

403.3.2.2 Outdoor air for other spaces. This section is not adopted.

403.3.2.3 Local exhaust. This section is not adopted.

403.3.2.4 System controls. This section is not adopted.

403.4 Group R whole house mechanical ventilation system. Each dwelling unit or sleeping unit shall be equipped with a whole house mechanical ventilation system that complies with Sections 403.4.1 through 403.4.6. Each dwelling unit or sleeping unit shall be equipped with local exhaust complying with Section 403.4.7. All occupied spaces, including public corridors, other than the Group R dwelling units and/or sleeping units, that support these Group R occupancies shall meet the ((~~ventilation requirement of~~)) natural ventilation requirements of Section 402 or the mechanical ventilation requirements of Sections 403.1 through 403.3.

EXCEPTION: Alternate balanced whole house ventilation systems and local exhaust systems subject to the Washington State Energy Code, Residential Provisions serving Group R dwelling units designed and commissioned in accordance with ASHRAE Standard 62.2 are permitted.

403.4.1 System design. The whole house ventilation system shall consist of one or more supply fans, one or more exhaust fans, or an ERV/HRV with integral fans; and the associated ducts and controls. Local exhaust fans shall be permitted to serve as part of the whole house ventilation system when provided with the proper controls in accordance with Section 403.4.5. The systems shall be designed and installed to supply and exhaust the minimum outdoor airflow rates in accordance with Section 403.4.2 as corrected by the balanced and/or distributed whole house ventilation system coefficients in accordance with Section 403.4.3 where applicable.

Table 403.4.2
WHOLE HOUSE MECHANICAL VENTILATION AIRFLOW RATE
(CONTINUOUSLY OPERATING SYSTEMS)

Floor Area (ft^2)	Bedrooms((1)) [a]				
	1	2	3	4	>5
<500	30	30	35	45	50
500 - 1000	30	35	40	50	55
1001 - 1500	30	40	45	55	60
1501 - 2000	35	45	50	60	65
2001 - 2500	40	50	55	65	70
2501 - 3000	45	55	60	70	75
3001 - 3500	50	60	65	75	80
3501 - 4000	55	65	70	80	85
4001 - 4500	60	70	75	85	90
4501 - 5000	65	75	80	90	95

((1)) [a] Minimum airflow (Q_r) is set at not less than 30 cfm for each dwelling units.

403.4.2 Whole house mechanical ventilation rates. The sleeping unit whole house mechanical ventilation minimum outdoor airflow rate shall be determined in accordance with the breathing zone ventilation rates minimum outdoor airflow rate shall be determined in accordance with the breathing zone ventilation rates requirements of Section 403.3.1.1.1.2 using Equation 4-2. The dwelling unit whole house mechanical ventilation minimum outdoor airflow rate shall be determined in accordance with Equation 4-10 or Table 403.4.2.

$$Q_r = 0.01*A_{floor} + 7.5*(N_{br} + 1) \quad \textbf{(Equation 4-10)}$$

where:

Q_r = Ventilation airflow rate, cubic feet per minute (cfm) but not less than 30 cfm for each dwelling unit.

A_{floor} = Conditioned floor area, square feet (ft^2)

N_{br} = Number of bedrooms, not less than one.

Table 403.4.3
SYSTEM COEFFICIENT (C_{system})

System Type	Distributed	Not Distributed
Balanced	1.0	1.25
Not Balanced	1.25	1.5

403.4.3 Ventilation quality adjustment. The minimum whole house ventilation rate from Section 403.4.2 shall be adjusted by the system coefficient in Table 403.4.3 based on the system type not meeting the definition of a *balanced whole house ventilation system* and/or not meeting the definition of a *distributed whole house ventilation system*.

$$Q_v = Q_r * C_{system} \quad \textbf{(Equation 4-11)}$$

where:

Q_v = Quality-adjusted ventilation airflow rate in cubic feet per minute (cfm)

Q_r = Ventilation airflow rate, cubic feet per minute (cfm) from Equation 4-10 or Table ((~~403.4.1~~)) 403.4.2

C_{system} = System coefficient from Table 403.4.3

403.4.4 Whole house ventilation residential occupancies. Residential dwelling and sleeping unit whole house ventilation systems shall meet the requirements of Sections 403.4.4.1 or 403.4.4.2 depending on the occupancy of the residential unit.

403.4.4.1 Whole house ventilation in Group R-2 occupancies. Residential dwelling and sleeping units in Group R-2 occupancies system shall include supply and exhaust fans and be a *balanced whole house ventilation system* in accordance with Section 403.4.6.3. The system shall include a heat or energy recovery ventilator with a sensible heat recovery effectiveness as prescribed in Section C403.3.6 or when selected as an option of R406 of the *Washington State Energy Code*. The whole house ventilation system shall operate continuously at the minimum ventilation rate determined in accordance with Section 403.4. The whole house supply fan shall provide ducted outdoor ventilation air to each habitable space within the residential unit.

EXCEPTIONS:
1. *Interior adjoining spaces* that are ventilated from another habitable space are not required to have outdoor air ducted directly to the adjoining space. These systems are considered *not distributed whole house ventilation systems* and shall use the "not distributed" quality adjustment system coefficient in accordance with Section 403.4.3.
2. *Interior adjacent rooms* that are ventilated from another habitable space are not required to have outdoor air ducted directly to the *interior adjacent room*. These systems are considered *not distributed whole house ventilation systems* and shall use the "not distributed" quality adjustment system coefficient in accordance with Section 403.4.3. The interior adjacent room shall be provided with a transfer fan with a minimum airflow rate of 30 cfm or with relief air inlet with a minimum airflow of 20 cfm that is connected to the exhaust/relief air inlet of an ERV/HRV whole house ventilation system. Transfer fans that ventilate *interior adjacent rooms* shall meet the sone rating in Section ((~~403.3.6~~)) 403.4.6 and shall have whole house ventilation controls in accordance with Section 403.4.5.

403.4.4.2 Whole house ventilation for other than Group R-2 occupancies. Residential dwelling and sleeping units in other than Group R-2 occupancies, including I-1 condition 2 occupancies, shall have a whole house mechanical ventilation system with supply and exhaust fans in accordance with Section 403.4.6.1, 403.4.6.2, 403.4.6.3, or 403.4.6.4. The whole house ventilation system shall operate continuously at the

minimum ventilation rate determined in accordance with Section 403.4.2 unless configured with intermittent off controls in accordance with Section 403.4.6.5. The whole house supply fan shall provide ducted outdoor ventilation air to each habitable space within the residential unit.

EXCEPTIONS: 1. *Interior adjoining spaces* that are ventilated from another habitable space are not required to have outdoor air ducted directly to the adjoining space. These systems are considered *not distributed whole house ventilation systems* and shall use the "not distributed" quality adjustment system coefficient in accordance with Section 403.4.3.
2. *Interior adjacent rooms* that are ventilated from another habitable space are not required to have outdoor air ducted directly to the *interior adjacent room*. These systems are considered *not distributed whole house ventilation systems* and shall use the "not distributed" quality adjustment system coefficient in accordance with Section 403.4.3. The interior adjacent room shall be provided with a transfer fan with a minimum airflow rate of 30 cfm or with relief air inlet with a minimum airflow of 20 cfm that is connected to the exhaust/relief air inlet of an ERV/HRV whole house ventilation system. Transfer fans that ventilate *interior adjacent rooms* shall meet the sone rating in Section 403.4.6 and shall have whole house ventilation controls in accordance with Section 403.4.5.

403.4.5 Whole house ventilation controls.

1. The whole house ventilation system shall be controlled with manual switches, timers or other means that provide for automatic operation of the ventilation system that are readily accessible by the occupant;

2. Whole house mechanical ventilation system shall be provided with controls that enable manual override off of the system by the occupant during periods of poor outdoor air quality. Controls shall include permanent text or a symbol indicating their function. Recommended control permanent labeling to include text similar to the following: "Leave on unless outdoor air quality is very poor." Manual controls shall be provided with ready access for the occupant.

EXCEPTION: Central whole house mechanical systems with supply air and/or exhaust that serve more than one dwelling or sleep units are not required to have manual override off controls accessible to the occupant.

3. Whole house ventilation systems shall be configured to ((~~operating~~)) operate continuously except where intermittent off controls are provided in accordance with Section 403.4.6.5 and allowed by Section 403.4.4.2.

403.4.6 Whole house ventilation system component requirements. Whole house ventilation supply and exhaust fans specified in this section shall have a minimum efficacy as prescribed in the *Washington State Energy Code*. The fans shall be rated for sound at a maximum of 1.0 sone at design airflow and static pressure conditions. Design and installation of the system or equipment shall be carried out in accordance with manufacturer's installation instructions.

EXCEPTIONS: 1. Central supply or exhaust fans serving multiple residential units do not need to comply with the maximum fan sone requirements.
2. Interior joining spaces provided with a 30 cfm transfer fan or a 25 square foot permanent opening do not require supply ventilation air directly to the space. Transfer fans shall meet the sone rating above and have whole house ventilation controls in accordance with Section 403.4.5.

403.4.6.1 Exhaust fans. Exhaust fans required shall be ducted directly to the outside in accordance with Section 501.3. Exhaust air outlets shall be designed to limit the pressure difference to the outside to limiting the outlet free area maximum velocity to 500 feet per minute and equipped with backdraft dampers or motorized dampers in accordance with *Washington State Energy Code*. Exhaust fans shall be tested and rated in accordance with HVI 915, HVI 916, and HVI 920. Exhaust fans required in this section may be used to provide local ventilation. Exhaust fans serving spaces other than kitchens that are designed for intermittent exhaust rates in Table 403.4.7 shall be provided with occupancy sensors, humidity sensors, timer controls, or pollutant sensor controls to automatically override the fan to the high speed airflow rate. The exhaust fans shall be tested and the testing results shall be submitted and posted in accordance with Section 403.4.6.7.

EXCEPTIONS: 1. Central exhaust fans serving multiple residential units do not need to comply with the HVI testing requirements.

2. Inlet free area maximum velocity may exceed 500 feet per minute when a factory-built combined exhaust/intake termination fitting is used.

403.4.6.2 Supply fans. Supply fans used in meeting the requirements of this section shall supply outdoor air from intake openings in accordance with Sections 401.4 and 401.5. Intake air openings shall be designed to limit the pressure difference to the outside to limiting the inlet free area maximum velocity to 500 feet per minute and when designed for intermittent off operation shall be equipped with motorized dampers in accordance with the *Washington State Energy Code*. Supply fans shall be tested and rated in accordance with HVI 915, HVI 916, and HVI 920. Where outdoor air is provided to each habitable dwelling unit or sleeping unit by supply fan systems the outdoor air shall be filtered. The filter shall be provided with access for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 8.

EXCEPTION: Central supply fans serving multiple residential units do not need to comply with the HVI testing requirements.

403.4.6.3 Balanced whole house ventilation system. A balanced whole house ventilation system shall include both supply and exhaust fans. The supply and exhaust fans shall have airflow that is within 10 percent of each other. The tested and balanced total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater, of the total mechanical supply airflow rate. The flow rate test results shall be submitted and posted in accordance with Section 403.4.6.7. The exhaust fan shall meet the requirements of Section 403.4.6.1. The supply fan shall meet the requirements of Section 403.4.6.2. For Group R-2 dwelling and sleeping units, the system is required to have balanced whole house ventilation but is not required to have distributed whole house ventilation where the not distributed system coefficient from Table 403.4.3 is utilized to correct the whole house mechanical ventilation rate. The system shall be designed and balanced to meet the pressure equalization requirements of Section 501.4. Local exhaust systems that are not a component of the whole-house mechanical ventilation system are exempt from the balanced airflow calculation.

403.4.6.4 Furnace integrated supply. Systems using space condition heating and/or cooling air handler fans for outdoor air supply air distribution are not permitted.

EXCEPTION: Air handler fans shall be permitted that have multi-speed or variable speed supply airflow control capability with a low speed operation not greater than 25 percent of the rated supply air flow capacity during ventilation only operation. Outdoor air intake openings must meet the provisions of Sections 401.4 and 401.5 and must include a motorized damper that is activated by the whole house ventilation system controller. Intake air openings shall be designed to limit the pressure difference to the outside to limiting the inlet free area maximum velocity to 500 ft per min. The motorized damper must be controlled to maintain the outdoor airflow intake airflow within 10 percent of the whole house mechanical exhaust airflow rate. The supply air handler shall provide supply air to each habitable space in the residential unit. The whole house ventilation system shall include exhaust fans in accordance with Section 403.4.6.1 to meet the pressure equalization requirements of Section 501.4. The flow rate for the outdoor air intake must be tested and verified at the minimum ventilation fan speed and the maximum heating or cooling fan speed. The results of the test shall be submitted and posted in accordance with Section 403.4.6.7.

403.4.6.5 Intermittent off operation. Whole house mechanical ventilation systems shall be provided with advanced controls that are configured to operate the system with intermittent off operation and shall operate for a least two hours in each four-hour segment. The whole house ventilation airflow rate determined in accordance with Section 403.4.2 as corrected by Section 403.4.3 shall be multiplied by the factor determined in accordance with Table 403.4.6.5.

Table 403.4.6.5

INTERMITTENT WHOLE HOUSE MECHANICAL VENTILATION RATE FACTORS[a,b]

Run-time Percentage in Each 4-hour Segment	50%	66%	75%	100%
Factor[a]	2	1.5	1.3	1.0

[a] For ventilation system run-time values between those given, the factors are permitted to be determined by interpolation.

[b] Extrapolation beyond the table is prohibited.

403.4.6.6 Testing. Whole house mechanical ventilation systems shall be tested, balanced and verified to provide a flow rate not less than the minimum required by Sections 403.4.2 and 403.4.3. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals, outlet terminals or grilles or in the connected ventilation ducts. Where required by the building official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the building official and shall be posted in the residential unit in accordance with Section 403.4.6.7.

403.4.6.7 Certificate. A permanent certificate shall be completed by the mechanical contractor, test and balance contractor or other approved party and posted on a wall in the space where the furnace is located, a utility room, or an *approved* location inside the building. When located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label, or other required labels. The certificate shall list the flow rate determined from the delivered airflow of the whole house mechanical ventilation system as installed and the type of mechanical whole house ventilation system used to comply with Section 403.4.3.

403.4.7 Local exhaust. Bathrooms, toilet rooms and kitchens shall include a local exhaust system. Such local exhaust systems shall have the capacity to exhaust the minimum airflow rate in accordance with Table 403.4.7 and Table 403.3.1.1, including notes. Fans required by this section shall be provided with controls that enable manual override or automatic occupancy sensor, humidity sensor, timer controls, or pollutant sensor controls. An "on/off" switch shall meet this requirement for manual controls. Manual fan controls shall be provided with ready access in the room served by the fan.

Table 403.4.7
MINIMUM EXHAUST RATES

Area to be exhausted	Exhaust Rate	
	Intermittent	Continuous
Open kitchens	In accordance with Section 403.4.7.3	Not permitted
Enclosed kitchens	In accordance with Section 403.4.7.3	5 ACH based on kitchen volume
Bathrooms - Toilet rooms	50 cfm	20 cfm

403.4.7.1 Whole house exhaust controls. If the local exhaust fan is included in a whole house ventilation system in accordance with Section 403.4.6, the exhaust fan shall be controlled to operate as specified in Section 403.4.5.

403.4.7.2 Local exhaust fans. Exhaust fans shall meet the following criteria.

1. Exhaust fans shall be tested and rated in accordance with HVI 915, HVI 916, and HVI 920 or equivalent.

2. Fan airflow rating and duct system shall be designed and installed to deliver at least the exhaust airflow required by Table 403.4.7. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device. Local exhaust systems shall be tested and verified to provide a flow rate not less than the minimum required by this section.

3. Design and installation of the system or equipment shall be carried out in accordance with manufacturers' installation instructions.

4. Intermittent local exhaust system serving kitchens shall be rated for sound at a maximum of 3 sones at one or more airflow settings not less than 100 cfm at a static pressure not less than that determined at working speed as specified in HVI 916 Section 7.2.

5. Continuous local exhaust system serving kitchens shall be rated for sound at a maximum of 1 sone at one or more airflow settings not less than 100 cfm at a static pressure not less than that determined at working speed as specified in HVI 916 Section 7.2.

EXCEPTIONS: 1. The installed airflow is not required to be field-verified where an exhaust airflow rating at a pressure of 0.25 in. w.g. may be used, provided the duct sizing meets the prescriptive requirements of Table 403.4.7.2.
2. Remote mounted fans need not meet sound requirements. To be considered for this exception, a remote mounted fan shall be mounted outside the kitchen, and there shall be at least 4 feet (1 m) of ductwork between the fan and the intake grille.

Table 403.4.7.2

PRESCRIPTIVE EXHAUST DUCT SIZING

Fan Tested cfm at 0.25 inches w.g.	Minimum Flex Diameter	Maximum Length in Feet	Minimum Smooth Diameter	Maximum Length in Feet	Maximum Elbows[a]
50	4 inches	25	4 inches	70	3
50	5 inches	90	5 inches	100	3
50	6 inches	No Limit	6 inches	No Limit	3
80	4 inches[b]	NA	4 inches	20	3
80	5 inches	15	5 inches	100	3
80	6 inches	90	6 inches	No Limit	3
100	5 inches[b]	NA	5 inches	50	3
100	6 inches	45	6 inches	No Limit	3
125	6 inches	15	6 inches	No Limit	3
125	7 inches	70	7 inches	No Limit	3

a. For each additional elbow, subtract 10 feet from length.
b. Flex ducts of this diameter are not permitted with fans of this size.

403.4.7.3 Local intermittent kitchen exhaust system. Kitchen range hoods for domestic cooking appliances shall meet or exceed either the minimum airflow or the minimum capture efficiency in accordance with Table 403.4.7.3. Capture efficiency ratings shall be determined in accordance with ASTM E3087.

EXCEPTION: Other intermittent kitchen exhaust fans, including downdraft, shall meet or exceed 300 cfm airflow.

Table 403.4.7.3

Kitchen Range Hood Airflow Rates (CFM) and ASTM E3087 Capture Efficiency (CE) Ratings According to Kitchen Range Fuel Type

Hood Over Electric Range	Hood Over Combustion Range
65 percent CE or 160 cfm	80 percent CE or 250 cfm

403.4.7.3.1 Field verification and diagnostic testing for local intermittent kitchen exhaust system. The local exhaust system for kitchens shall be installed to comply with local mechanical exhaust requirements specified in Section 403.4.7.3 and shall be field verified in accordance with the procedures below to confirm the model is rated by HVI or AHAM to comply with the following requirements:

1. Local intermittent exhaust system for kitchens shall be tested and verified to provide a minimum airflow rate or capture efficiency required by Section 403.4.7.3. Testing shall include verification of the maximum sound rating as specified in Section 403.4.7.2. Testing for the intermittent kitchen exhaust systems shall occur with the whole house ventilation system operating and with all dwelling unit or sleeping unit entry doors closed. Testing for exhaust systems that require mechanical makeup air in accordance with Section 505.4 shall include verifying that the mechanical makeup air opening is open. Testing for exhaust systems that require mechanical makeup air in accordance with Section 505.4 shall include verifying that the mechanical makeup air system is controlled to automatically start. Testing for exhaust systems that do not require mechanical makeup air in accordance with Section 505.4 and that are exempt from pressurize equalization per Section 501.4 shall be tested with operable openings manually opened unless design exhaust airflow can be achieved with all operable openings closed. Where required by the building official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the building official.

EXCEPTION: The installed airflow is not required to be field-verified where an exhaust airflow rating at a pressure of 0.25 in. w.g. is used, provided the duct sizing meets the prescriptive requirements of Table 403.4.7.2.

2. The verification shall utilize certified rating data from *HVI Publication 911*, *AHAM-Certified Range Hood Directory*, or another directory of certified product performance ratings approved by the code official for determining compliance. The verification procedure shall consist of visual inspection of the local intermittent kitchen exhaust system to verify and record the following information:

2.1. The manufacturer name and model number.

2.2. The model is listed in the HVI, AHAM, or equivalent directory.

2.3. The rated airflow value listed in the HVI, AHAM, or equivalent directory.

2.4. The sound rating value listed in the HVI, AHAM, or equivalent directory.

2.5. If the value for the rated airflow given in the directory is greater than or equal to the airflow requirements specified in Section 403.4.7.3 and if the value for the sone rating given in the directory is less than or equal to the sone rating requirements specified in Section 403.4.7.2, then the local intermittent kitchen exhaust system complies, otherwise the local intermittent kitchen exhaust system does not comply.

AMENDATORY SECTION (Amending WSR 23-02-055, 23-12-106, and 23-20-025, filed 1/3/23, 6/7/23, and 9/25/23, effective 3/15/24)

WAC 51-52-0501 Section 501—General.

501.3.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. **For ducts conveying explosive or flammable vapors, fumes or dusts:** 30 feet (9144 mm) from the property line; 10 feet (3048 mm) from operable openings into the building; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into the building which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.

2. **For other product-conveying outlets:** 10 feet (3048 mm) from property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into the building; 10 feet (3048 mm) above adjoining grade.

3. **For environmental air exhaust other than enclosed parking garage and transformer vault exhaust:** 3 feet (914 mm) from property lines, 3 feet (914 mm) from operable openings into buildings for all occupancies other that Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious. Separation is not required between intake air openings and living space *exhaust air* openings of an individual *dwelling unit* or *sleeping unit* where an approved factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the manufacturer's instructions.

EXCEPTIONS:
1. The separation between an air intake and exhaust outlet on a single listed package HVAC unit.
2. Exhaust from environmental air systems other than garages may be discharged into an open parking garage.
3. Except for Group I occupancies, where ventilation system design circumstances require building HVAC air to be relieved, such as during economizer operation, such air may be relieved into an open or enclosed parking garage within the same building.

4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section ((~~1613~~)) 1612 of the *International Building Code* for utilities and attendant equipment.

5. For enclosed parking garage exhaust system outlets and transformer vault exhaust system outlets: 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 3 feet (914 mm) horizontally from, 10 feet above, or 10 feet below adjoining finished walkways.

6. For transformer vault exhaust system outlets, subject to the requirements of NFPA 70 Section 450.45: Ten feet (3048 mm) from fire escapes, required means of egress at the exterior of the building, elements of exit discharge, exterior combustible materials, and openings that are not protected in accordance with Section 705.8 of the *International Building Code*; 10 feet (3048 mm) from property lines which separate one lot from another; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above walkways.

7. For elevator machinery rooms in enclosed or open parking garages: Exhaust outlets may discharge air directly into the parking garage.

8. For specific systems see the following sections:

8.1. Clothes dryer exhaust, Section 504.4.

8.2. Kitchen hoods and other kitchen exhaust equipment, Sections 506.3.13, 506.4 and 506.5.

8.3. Dust stock and refuse conveying systems, Section 511.2.

8.4. Subslab soil exhaust systems, Section 512.4.

8.5. Smoke control systems, Section 513.10.3.
8.6. Refrigerant discharge, Section 1105.7.
8.7. Machinery room discharge, Section 1105.6.1.

501.4 Pressure equalization. Mechanical exhaust systems shall be sized to remove the quantity of air required by this chapter to be exhausted. The system shall operate when air is required to be exhausted. Where mechanical exhaust is required in a room or space, such space shall be maintained with a neutral or negative pressure. If a greater quantity of air is supplied by a mechanical ventilating supply system than is removed by a mechanical exhaust for a room, adequate means shall be provided for the natural or mechanical exhaust of the excess air supplied. If only a mechanical exhaust system is installed for a room or if a greater quantity of air is removed by a mechanical exhaust system than is supplied by a mechanical ventilating supply system for a room, adequate makeup air consisting of supply air, transfer air or outdoor air shall be provided to satisfy the deficiency. The calculated building infiltration rate shall not be used to satisfy the requirements of this section.

EXCEPTION: Intermittent kitchen exhaust, intermittent domestic dryer exhaust, and intermittent local exhaust systems in R-3 occupancies and dwelling units in R-2 occupancies are excluded from the pressure equalization requirement unless required by Section 504 or Section 505.

AMENDATORY SECTION (Amending WSR 16-01-148, filed 12/21/15, effective 7/1/16)

WAC 51-52-0602 Section 602—((~~Duct construction and installation~~)) Plenums.

602.1 General. Supply, return, exhaust, relief and ventilation air plenums shall be limited to uninhabited crawl spaces, areas above a ceiling or below the floor, attic spaces and mechanical equipment rooms. Plenums shall be limited to one fire area. Air systems that serve multiple fire areas shall be ducted from the boundary of the fire area served directly to the air-handling equipment. Fuel-fired appliances shall not be installed within a plenum.

AMENDATORY SECTION (Amending WSR 20-03-041, filed 1/8/20, effective 7/1/20)

WAC 51-52-1106 Section 1106—Machinery room, special requirements.

((~~1106.5.2~~)) 1106.4.2 Emergency ventilation system. An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table ((~~1106.5.2~~)) 1106.4.2. Shutdown of the emergency ventilation system shall be by manual means.

Table ((~~1106.5.2~~)) 1106.4.2
MINIMUM EXHAUST RATES

Refrigerant	Q(m/sec)	Q(cfm)
R32	15.4	32,600
R143A	13.6	28,700
R444A	6.46	13,700

Refrigerant	Q(m/sec)	Q(cfm)
R444B	10.6	22,400
R445A	7.83	16,600
R446A	23.9	50,700
R447A	23.8	50,400
R451A	7.04	15,000
R451B	7.05	15,000
R1234yf	7.80	16,600
R1234ze(E)	5.92	12,600

AMENDATORY SECTION (Amending WSR 23-02-055, 23-12-106, and 23-20-025, filed 1/3/23, 6/7/23, and 9/25/23, effective 3/15/24)

WAC 51-52-21409 Section 409 (IFGC)—((~~Drips and sloped piping~~)) Shutoff valves.

Table 409.1.1
Natural Gas Valve Standards

Valve Standards	Appliance Shutoff Valve Application Up to 1/2 psig Pressure	Other Valve Applications			
		Up to 1/2 psig Pressure	Up to 2 psig Pressure	Up to 5 psig Pressure	Up to 125 psig Pressure
ANSI Z21.15/CGA 9.1	X	--	--	--	--
ASME B16.44	X	X	X[a]	X[b]	--
ASME B16.33	X	X	X	X	X
ASME B16.38	--	X	X	X	X

For SI: 1 pound per square inch gauge = 6.895 cPsa
a. If labeled 2G.
b. If labeled 5G.