IMC Existing Amendment Review

Summary:	Repeal existing state amendments: 5	Keep Existing amendment as modified: 11	Keeping existing amendment (May include renumbering): 52

Red text = State amended language

Blue text = Model code change

Last Updated: June 27, 2024

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
Chapter 1 Scope and Administration							
51-52-0101	**Scope and General Requirements**						
	Scope	101.2	Same	Allows Group I-1 Condition 2 to be considered a Group R occupancy (2015). Adds statutory requirement for use of NFPA 54 and 58 for LP gas (2004).	Keep existing amendment but updated language in exception 1 to match 2024 (and 2021) IMC language	Retain amendment with suggested modifications	
	[A] 101.2 Scope. This code shall regulate the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions and related processes within *buildings*. This code shall also regulate those mechanical systems, system components, *equipment* and *appliances* specifically addressed herein. The installation of fuel gas distribution piping and *equipment*, fuel gas-fired *appliances* and fuel gas-fired *appliance* venting systems shall be regulated by the *International Fuel Gas Code*. References in this code to Group R shall include Group I-1, Condition 2 assisted living facilities licensed by Washington State Under chapter 388-78A WAC and Group I-1, Condition 2 residential treatment facilities licensed by Washington state under chapter 246-337 WAC. **Exceptions:** **1.** Detached one- and two-family *dwellings* **and townhouses** not more than three stories above grade plane in height with a separate means of egress and their accessory structures not more than three stories above grade plane in height shall comply with this code or the *International Residential Code*. 2. The standards for liquefied petroleum gas installations shall be the 2023 Edition of NFPA 58 (Liquified Petroleum Gas Code) and the 2024 Edition of ANSI Z223/NFPA 54 (National Fuel Gas Code).					
51-52-0113	**Stop Work Order**						
	Failure to comply	113.4 (116.4)	115.4	Changes "fine established by the authority having jurisdiction to "fine established by the code official.' It was felt that authority should be at the code official level (2021)	Keep existing amendment Recommend removal to remain consistent with the other model codes.	Retain amendment	Pursue code change to retain model code language for consistency

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	115.4 Failure to comply. Any person who shall continue any work after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be subject to fines established by the ~~authority having jurisdiction~~code official						
Chapter 2 Definitions							
51-52-0202	**Definitions**						
	Balanced Whole House Ventilation			Definition to support the requirement for balanced ventilation in multifamily to limit cross contamination (2018)	Keep existing amendment	Retain amendment	
	BALANCED WHOLE HOUSE VENTILATION. Any combination of concurrently operating residential dwelling or sleeping unit mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater, of the total supply airflow rate.						
	Not Balanced Whole House Ventilation			Definition to support the requirement for balanced ventilation in multifamily to limit cross contamination (2018)	Keep existing amendment	Retain amendment	
	NOT BALANCED WHOLE HOUSE VENTILATION. A whole house ventilation system serving a dwelling or sleeping unit that is not considered balanced in accordance with the definition in this code for *balanced whole house ventilation* system. Only other than Group R-2 dwelling and sleeping units are allowed in accordance with Section 403.4.4.1 to have *not balanced whole house ventilation* systems.						
	Distributed Whole House Ventilation			Definition to support the requirement for balanced ventilation in multifamily to limit cross contamination (2018)	Keep existing amendment	Retain amendment	
	DISTRIBUTED WHOLE HOUSE VENTILATION. A whole house ventilation system shall be considered distributed when it supplies outdoor air directly (not transfer air) to each dwelling or sleeping unit habitable space (living room, den, office, *interior adjacent room, interior adjoining spaces* or bedroom), and exhausts air from all kitchens and bathrooms directly outside.						
	Not Distributed Whole House Ventilation			Definition to support the requirement for balanced ventilation in multifamily to limit cross contamination (2018)	Keep existing amendment	Retain amendment	
	NOT DISTRIBUTED WHOLE HOUSE VENTILATION. A whole house ventilation system shall be considered not distributed when either the supply system or the exhaust system is not distributed. Supply systems are not distributed when a habitable space is supplied with outdoor air to ventilate an interior adjacent room or an interior adjoining space. Exhaust systems are not distributed when all bathrooms and kitchens are not exhausted by the whole house ventilation system. If either the supply system or the exhaust system is not distributed, then the ventilation quality adjustment system coefficient adjustment is required in accordance with Section 403.4.3						

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	Enclosed Kitchen			Added definition to support requirements for residential kitchen exhaust requirements (2021)	Keep existing amendment	Retain amendment	
	ENCLOSED KITCHEN. A kitchen whose permanent openings to interior adjacent spaces do not exceed a total of 60 square feet ($6m^2$).						
	Interior Adjacent Room			Helps clarify the whole house ventilation requirements and when balanced ventilation is required (2021)	Keep existing amendment	Retain amendment	
	INTERIOR ADJACENT ROOM. An enclosed room without exterior windows or openings to the outdoors located within a dwelling or sleeping unit that does not have interior unobstructed openings required for an interior adjoining space.						
	Interior Adjoining space			Helps clarify the whole house ventilation requirements and when balanced ventilation is required (2021)	Keep existing amendment	Retain amendment	
	INTERIOR ADJOINING SPACE. A room or space without openings to the outdoors that is naturally ventilated from another habitable space by unobstructed fixed openings sized in accordance with Section 402.3.						
	Local Exhaust			Added to correlate with IRC and replaces source specific ventilation (2012, 2018)	Keep existing amendment	Retain amendment	
	LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a residential dwelling or sleeping unit.						
	Permanent Construction			Added to clarify requirements in 306.6 (2015)	Keep existing amendment	Retain amendment	
	PERMANENT CONSTRUCTION. Construction that, if removed, would disturb the structural integrity of the building or the fire-resistance rating of a building assembly.						
	Relief Air			Clarification based on 2015 Seattle code (2018)	Keep existing amendment	Retain amendment	
	RELIEF AIR. Exhausted return air from a system that provides ventilation for human usage.						
	Replacement Air			Added to correlate with energy code requirements and section 508; from ASHRAE 90.1 (2018)	Keep existing amendment	Retain amendment	

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	REPLACEMENT AIR. Outdoor air that is used to replace air removed from a building through an exhaust system. Replacement air may be derived from one or more of the following: Makeup air, supply air, transfer air, and infiltration. However, the ultimate source of all replacement air is outdoor air. When replacement air exceeds exhaust, the result is exfiltration.						
	Whole House Ventilation System			Integrated from the Washington Ventilation and Indoor Air Quality Code (2009)	Keep existing amendment	Retain amendment	
	WHOLE HOUSE VENTILATION SYSTEM. A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct means, air from the habitable rooms with outdoor air.						
	Ventilation Zone			From ASHRAE 62.1-2019 (2018)	Keep existing amendment	Retain amendment	
	VENTILATION ZONE. Any indoor area that requires ventilation and comprises one or more spaces with the same occupancy category (see Table 403.3.1.1), occupant density, zone air distribution effectiveness (see Section 403.3.1.1.1.2), and design zone primary airflow per unit area.						
Chapter 3 General Regulations							
51-21-0306	**Access and service space**						
	Equipment or appliances on roofs or elevated structures	306.5	306.5	Correlate with OSHA and WISHA rules on access (2009)	Amendment to no longer needed L&I rules updated and match the model code.	Delete amendment	
	306.1 Equipment or appliances on roofs or elevated structures. Where *equipment* requiring access or *appliances* are located on an elevated structure or the roof of a *building* such that personnel will have to climb higher than 16 feet (4877 mm) above grade to access such *equipment* or *appliances*, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall. Permanent ladders installed to provide the required access shall comply with the following minimum design criteria: 1. The side railing shall extend above the parapet or roof edge or landing platform not less than 42 inches (1067 mm). 2. Ladders shall have rung spacing not to exceed 12 inches (305 mm) ~~not less than 10 inches (254 mm) and not to exceed 14 inches (356 mm)~~ on center. The upper-most rung shall be not greater than 24 inches (610 mm) below the upper edge of the roof hatch, roof or parapet, as applicable. 3. Ladders shall have a toe spacing not less than 7 inches (178 mm) and not more than 12 inches (305 mm) deep. 4. There shall be not less than 16 inches (406 mm) between rails. 5. Rungs shall have a diameter not less than 0.75-inch (19.1 mm) and be capable of withstanding a 300-pound (136 kg) load. 6. Ladders over 30 feet (9144 mm) in height shall be provided with offset sections and landings capable of withstanding 100 pounds per square foot (488 kg/m^2). Landing dimensions shall be not less than 18 inches (457 mm) and not less than the width of the						

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	ladder served. A guard rail shall be provided on all open sides of the landing. 7. Climbing clearance. The distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be not less than 30 inches (762 mm) measured perpendicular to the rungs. This distance shall be maintained from the point of ladder access to the bottom of the roof hatch. A minimum clear width of 15 inches (381 mm) shall be provided on both sides of the ladder measured from the midpoint of and parallel with the rungs except where cages or wells are installed. 8. Landing required. The ladder shall be provided with a clear and unobstructed bottom landing area having a minimum dimension of 30 inches (762 mm) by 30 inches (762 mm) centered in front of the ladder. 9. Ladders shall be protected against corrosion by *approved* means. 10. Access to ladders shall be provided at all times. 11. Top landing required. The ladder shall be provided with a clear and unobstructed landing on the exit side of the roof hatch, having a minimum space of 30 inches (762 mm) deep and being the same width as the hatch. Catwalks installed to provide the required access shall be not less than 24 inches (610 mm) wide and shall have railings as required for service platforms.						
	Appliances above ceilings	306.6	306.6	Clarification of access requirements for installations above the ceiling (2015)	Retain amendment	Retain amendment	
	306.6 Appliances above ceilings. Appliances that are located above ceilings shall have access for inspection, service and repair without removing permanent construction. Appliances that are located above a ceiling shall be provided with access to the working space(s) by an opening not smaller than 22 inches by 22 inches (559 mm x 559 mm). All enclosure doors or hinged panels shall be capable of opening a minimum of 90 degrees. The appliance is not required to be removable or replaceable through the enclosure door, hinged panel, removable lay-in ceiling tile, or other removable covers. The appliance may be removed or replaced by removing the ceiling or wall assemblies adjacent to the appliance as long as they are not permanent construction. **Exceptions:** 1. This section shall not apply to replacement appliances installed in existing compartments and alcoves where the working space clearances are in accordance with the appliance manufacturer's installation instructions. 2. A smaller enclosure door, hinged panel, removable lay-in ceiling tile, or other removable covers shall be permitted when allowed by the equipment or appliance manufacturer's installation instructions and electrical access is not required.						
51-52-0307	**Condensate disposal**						
	Auxiliary and secondary drain systems	307.2.3	307.2.3	Adds a second exception for unducted fan coil units (2012)	Retain amendment	Retain amendment	
	307.1.1 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any *building* components could occur as a result of overflow from the *equipment* primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired *appliance* that produces condensate: 1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of $1^1/_2$ inches (38 mm), shall be not less than 3 inches (76 mm) larger than the unit, or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage). Nonmetallic pans shall have a minimum thickness of not less than						

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	0.0625 inch (1.6 mm). 2. A separate overflow drain line shall be connected to the drain pan provided with the *equipment*. Such overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection. 3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the *equipment* served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section. 4. A water-level detection device conforming to UL 508 shall be provided that will shut off the *equipment* served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan. **Exceptions:** 1. Fuel-fired *appliances* that automatically shut down operation in the event of a stoppage in the condensate drain- age system. 2. Unducted fan coil units where there is no factory option available for water-level detection devices and which are installed directly within the occupied space.						
	Ductless mini-split system traps	307.2.4.1	307.2.4.1	Allows for other means of drainage per manufacturer instructions (2015)	Retain amendment	Retain amendment	
	307.2.4.1 Ductless mini-split system traps. Ductless mini-split *equipment* that produces condensate shall be provided with an inline check valve located in the drain line, or a trap, or other means of condensate drainage in accordance with the manufacturer's instructions.						
	Chapter 4 Ventilation						
51-52-0401	**General**						
	Ventilation required	401.2	401.2	Reformats scoping section to incorporate state requirements for mechanical ventilation and specific state amendments. Moves information into subsections for various occupancies. (2009)	Retain amendment	Retain amendment	Should consider making the sentence for enclosed parking and repair garages a separate subsection consistent with the other added subsections
	401.1 Ventilation required. Every occupied space other than enclosed parking garages and buildings used for repair of automobiles shall be ventilated ~~by natural means~~ in accordance with ~~Section 402 or by mechanical means in accordance with~~ Section ~~403~~401.2.1, 401.2.2 or 401.2.3. Enclosed parking garages and buildings used for the repair of automobiles ~~*Dwelling units* complying with the air leak- age requirements of the *International Energy Conservation Code* or ASHRAE 90.1~~ shall be ventilated by mechanical means in accordance with Sections 403 and 404~~.~~						

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	~~Ambulatory care facilities and Group I-2 *occupancies* shall be ventilated by mechanical means in accordance with Section 407~~.						
	Group R occupancies	401.2.1	401.2.1	Pointer to the required state ventilation standards for Group R in 403.4 (2009)	Retain amendment	Retain amendment	
	401.2.1 Group R occupancies. Ventilation in Group R occupancies shall be provided in accordance with Section 403.4.						
	Ambulatory care facilities and Group I-2 occupancies	401.2.2	401.2.2	Pointer to the requirements for Group I-2 (2015)	Retain amendment	Retain amendment	
	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.						
	All other occupancies	401.2.3	401.2.3	Pointer for all other occupancies (2009)	Retain amendment	Retain amendment	
	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.						
	When required	401.3	401.3	Specifies that residential needs continuous ventilation, or may be intermittently ventilated per 403.4 (2015)	Retain amendment	Retain amendment	
	401.1 When required. ~~Ventilation~~ 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.						
	Intake opening location	401.4	401.4	Clarifies that intake ventilation air can come through the garage entry door or locations adjacent to vehicular surfaces (2018); Allowance for air intakes less than 25 feet above a parking lot to decrease "snorkel effect." (2021)	Retain amendment; keep editorial model code changes	Retain amendment with editorial change on exception 2.3	
	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.						

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	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:** 2.1. 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. 2.2. 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. **2.3** 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 or loading dock. ~~2.~~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 a factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the fan 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.						
	Testing and balancing	401.7	401.7	Allows the official to require testing to verify ventilation rates (2009)	Retain amendment	Retain amendment	
	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 building official.						
51-52-0403	**Mechanical ventilation**						
	Ventilation system	403.1	403.1	The sentence for residential under three stories was struck due to conflict with whole house ventilation requirements (2015)	Retain state amendment	Retain amendment	
	403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or *exhaust air* ~~except that mechanical *ventilation air* requirements for Group R-2, R-3 and R-4 *occupancies* shall be provided by an exhaust system, supply system or combination thereof~~. 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.						

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	Outdoor air required	403.2	403.2	A second exception was added to allow ASHRAE 62.1 as an alternate method (2021)	Retain state amendment	Retain amendment	
	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.						
	Recirculation of air	403.2.1	403.2.1	The existing amendment is missing the addition of "outdoor" in the first sentence and the new terminology on sizing in item 2. The amendment is in item 3, removing "Recirculation of air that is contained completely within such spaces shall not be prohibited" based on requirements from the VIAQ code (2006)	Retain amendment to Item 3 but integrate the ICC base code language for the first sentence and Item 2.	Agree with staff recommendation	
	403.2.1 Recirculation of air. The outdoor 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 more than 10 percent 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. ~~Recirculation of air that is contained completely within such spaces shall not be prohibited. Where recirculation of air is prohibited, a~~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.						
	Outdoor air and local exhaust airflow rates	403.3	403.3	Group R-2, R-3 and R-4 was genericized to Group R (or remained as previously	Retain state amendment	Retain amendment	

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				published in early IMC) and "three stories and less…" removed to correlate with the whole house ventilation requirements, and a reference was added to the correct section. (2018)			
	403.3 Outdoor air and local exhaust airflow rates. Group R~~-2, R-3 and R-4~~ *occupancies* ~~three stories and less in height above grade plane~~ shall be provided with outdoor air and local exhaust in accordance with Section ~~403.3.2~~403.4. ~~Other~~ All other *buildings* intended to be occupied shall be provided with outdoor air and local exhaust in accordance with Section 403.3.1.						
	Outdoor airflow rate	403.3.1.1	403.3.1.1	Requires outdoor air to be supplied by ducts to all occupiable spaces (2018, 2015) An exception allows known occupant density to be used in place of size (2003)	Retain state amendment	Retain amendment	
	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 be not 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:** ~~The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3.1.1 where *approved* statistical data document the accuracy of an alternative anticipated occupant density~~Where occupancy density is known and documented in the plans, the outdoor airflow rate may be based on the design occupant density. Under no circumstances shall the occupancies used result in outdoor airflow less than one-half that resulting from application of Table 403.3.1.1 estimated maximum occupancy rates.						
	Required Outdoor Ventilation Air	Table 403.3.1.1	Table 403.3.1.1	Added "kitchenettes" to office space (2012) Amended private dwellings to correlate with the whole house ventilation requirements	Retain state amendment, but integrate new items in 2024 IMC	Accept staff recommendation	

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				(2003-2018) Added Group R corridors, elevators in parking garages (2015) Janitor closets, storage rooms for chemicals (2012) Freezer and refrigerated spaces in Workrooms (2015)			
	(See page 31 for text)						
	Outdoor airflow rate calculations/Multiple zone recirculation systems	403.3.1.1.2.3 thru 403.3.1.1.2.3.4	403.3.1.1.2.3 thru 403.3.1.1.2.3.4	Replaces the IMC formulas with those from ASHRAE 62.1-2019 (2018)	Retain state amendment	Retain amendment	The 2022 edition of ASHRAE 62.1 appears unchanged from the 2019 edition
	403.1.1.2.3 Multiple zone recirculating systems. ~~Where~~ For ventilation air systems wherein one or more air handlers supplies a mixture of outdoor air and recirculated ~~return~~ air to more than one ventilation zone, the ~~system~~ outdoor air intake flow rate (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 ~~Primary outdoor air fraction~~Uncorrected outdoor air intake.** ~~The primary outdoor air fraction (Z_p) shall be determined for each zone~~ The uncorrected outdoor air intake flow (V_{ot}) shall be determined in accordance with Equation 4-5. **Equation 4-5** $Z_p = \frac{V_{oz}}{V_{pz}}$ $V_{ou} = D\sum \text{all zones})(R_p \times P_z) + \sum \text{all zones}(R_z \times A_z)$ where: ~~V_{pz} = Primary airflow: The airflow rate supplied to the zone from the airhandling unit at which the outdoor air intake is located. It includes outdoor intake air and recirculated air from that air handling unit but does not include air transferred or air recirculated to the zone by other means. For design purposes, V_{pz} shall be the zone design primary airflow rate, except for zones with variable air volume supply and V_{pz} shall be the lowest expected primary airflow rate to the zone when it is fully occupied.~~ D = Occupant diversity: the ratio of the system population to the sum of the zone populations, determined in accordance with Equation 4-6 **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. $D = P_s/\sum \text{all zones} P_z$ (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 Vou value is no less than that determined using Equation 4-5.						

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	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 ~~using Table~~ in accordance with Section 403.3.1.1.2.3.~~2~~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. ~~**TABLE 403.3.1.1.2.3.2—SYSTEM VENTILATION EFFICIENCY[a, b]**~~ ~~**403.3.1.1.2.3.3 Uncorrected outdoor air intake.** The uncorrected outdoor air intake flow rate (V_{ou}) shall be deter- mined in accordance with Equation 4-6.~~ ~~**Equation 4-6**~~ ~~where:~~ ~~P_s = System population: The total number of occupants in the area served by the system. For design purposes, P_s shall be the maximum number of occupants expected to be concurrently in all zones served by the system.~~ ~~**403.3.1.1.2.3.4 Outdoor air intake flow rate.** The outdoor air intake flow rate (V_{ot}) shall be determined in accordance with Equation 4-8~~ ~~**Equation 4-8**~~ **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. $E_v = 0.88 \times D + 0.22$ for $D < 0.60$ (**Equation 4-6a**) $E_v = 0.75$ for $D \geq 0.60$ (**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. $V_{pz\text{-}min} = V_{oz} \times 1.5$ (**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. $V_{ot} = V_{ou}/E_v$ (**Equation 4-8**)						
	Group R-2, R-3 and R-4 occupancies	403.3.2 thru 403.3.2.4	403.3.2 thru 403.3.2.4	Not adopted; referred to state-promulgated whole house ventilation requirements in 403.4 (2009 originally; as is currently formatted, 2015)	Retain state amendment	Retain amendment	
	403.3.2 Group R-2, R-3 and R-4 occupancies. ~~The design of local exhaust systems and ventilation systems for outdoor air in Group R-2, R-3 and R-4 *occupancies* shall comply with Sections 403.3.2.1 through 403.3.2.5~~This section is not adopted. See Section 403.4.						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	403.3.2.1 Outdoor air for dwelling units. An outdoor air ventilation system consisting of a mechanical exhaust system, supply system or combination thereof shall be installed for each *dwelling unit*. Local exhaust or supply systems, including outdoor air ducts connected to the return side of an air handler, are permitted to serve as such a system. The outdoor air ventilation system shall be designed to provide the required rate of outdoor air continuously during the period that the *building* is occupied. The minimum continuous outdoor airflow rate shall be determined in accordance with Equation 4-9.This section is not adopted. Equation 4-9 $Q_{OA}=0.03A_{floor}+7.5(N_{br}+1)$ where: Q_{OA} = outdoor airflow rate, cfm A_{floor} = conditioned floor area, ft^2 N_{br} = number of bedrooms; not to be less than one **Exceptions:** 1. The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor airflow rate over the 4-hour period shall be not less than that prescribed by Equation 4-9. 2. The minimum mechanical ventilation rate determined in accordance with Equation 4-9 shall be reduced by 30 percent provided that both of the following conditions apply: 2.1. A ducted system supplies *ventilation air* directly to each bedroom and to one or more of the following rooms: 2.1.1. Living room. 2.1.2. Dining room. 2.1.3. Kitchen. 2.2. The whole-house ventilation system is a *balanced ventilation system*. **403.3.2.2 Outdoor air for other spaces.** Corridors and other common areas within the conditioned space shall be provided with outdoor air at a rate of not less than 0.06 cfm per square foot [0.0003 $m^3/(s \times m^2)$] of floor areaThis section is not adopted. **403.3.2.3 Local exhaust.** Local exhaust systems shall be provided in kitchens, bathrooms and toilet rooms and shall have the capacity to exhaust the minimum airflow rate determined in accordance with Table 403.3.2.3This section is not adopted. **TABLE 403.3.2.3—MINIMUM REQUIRED LOCAL EXHAUST RATES FOR GROUP R-2, R-3 AND R-4 OCCUPANCIES** AREA TO BE EXHAUSTED / EXHAUST RATE CAPACITY Kitchens / 100 cfm intermittent or 50 cfm continuous Bathrooms and toilet rooms / 50 cfm intermittent or 25 cfm continuous For SI: 1 cubic foot per minute = 0.0004719 m^3/s. **403.3.2.4 System controls.** Where provided within a *dwelling unit*, controls for outdoor air ventilation systems shall include text or a symbol indicating the system's functionThis section is not adopted.					
	Group R whole house mechanical ventilation system	403.4 thru 403.4.7.3.1	403.4 thru 403.4.7.3.1	Washington's whole house ventilation code requirements (original VIAQ adopted in 1992; current version 2018)	Retain state amendment	Retain amendment	
	(see page 37 for text)						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
51-52-0404	**Enclosed parking garages and automobile repair facilities**						
	Automobile repair facilities	404.4	404.3	Requirement from the VIAQ code (2009)	Retain state amendment but renumber	Retain amendment and renumber	
	404.3 Automobile repair facilities. In buildings used for the repair of automobiles, each repair stall shall be equipped with an exhaust extension duct, extending to the outside of the building. Exhaust extension duct over 10 feet in length shall mechanically exhaust at least 300 cfm. Connecting offices and waiting rooms shall be supplied with conditioned air under positive pressure.						
51-52-0407	**Ambulatory care facilities and Group I-2 occupancies**						
	General	407.1	407.1	Amended to include DOH rules for ambulatory care and other health care facilities (2015)	Retain state amendment; add new ASHRAE 170 reference	Agree with staff recommendation	
	407.1 General. Mechanical ventilation for health care facilities licensed by Washington state shall be designed and installed in accordance with this code and the following provisions of the Washington Administrative Code (WAC): **1.** Mechanical ventilation in ambulatory care facilities shall comply with chapter 246-330 WAC. **2.** Mechanical ventilation for acute care hospitals shall comply with chapter 246-320 WAC. **3.** Mechanical ventilation for nursing homes shall comply with chapter 388-97 WAC. Mechanical ventilation for unlicensed ambulatory care facilities ~~and Group I-2 *occupancies*~~ shall be designed and installed in accordance with this code, ASHRAE/ASHE 170 and NFPA 99.						
	Chapter 5 Exhaust Systems						
51-52-0501	**General**						
	Location of exhaust outlets	501.3.1	501.3.1	Added exceptions for environmental air duct exhaust (2003) Added requirements for enclosed parking garages and transformer vaults (2009)	Retain state amendment; include new language in item 3 from model code	Retain amendment with updated item 3	
	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 property lines; 10 feet (3048 mm) from operable openings into buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings that 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 the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade. 3. For ~~all~~ *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, except where the exhaust opening is located not less than 1 foot (305 mm) above the gravity air intake opening into buildings for all *occupancies* other than Group U; and 10 feet (3048 mm) from mechanical air intakes. Such						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	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 a factory-built intake/exhaust combination termination fitting is used to separate the air streams in accordance with the fan 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. ~~3.~~4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the elevation required by Section 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 (3048 mm) above or 10 feet (3048 mm) below adjoining finished sidewalk. 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. ~~4.~~8. For specific systems, see the following sections: ~~4.1.~~8.1. Clothes dryer exhaust, Section 504.4. ~~4.2.~~8.2. Kitchen hoods and other kitchen exhaust *equipment*, Sections 506.3.13, 506.4 and 506.5. ~~4.3.~~8.3. Dust, stock and refuse conveying systems, Section 510.2. ~~4.4.~~8.4. Subslab soil exhaust systems, Section 511.4. ~~4.5.~~8.5. Smoke control systems, Section 512.10.3. ~~4.6.~~8.6. Refrigerant discharge, Section 1105.7. ~~4.7.~~8.7. *Machinery room* discharge, Section 1105.6.1.						
	Pressure equalization	501.4	501.4	Added exception to exempt residential units from pressure equalization requirements (2012, mod. In 2018)	Retain state amendment	Retain amendment	
	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 in other than *occupancies* in Group R-3 and *dwelling units* in Group R-2, 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* shall be provided to satisfy the deficiency.						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Exception: Intermittent kitchen exhaust, intermittent domestic dryer exhaust and intermittent local exhaust systems in Group R-3 occupancies and dwelling units in Group R-2 occupancies are excluded from the pressure equalization requirements unless required by Section 504 or 505.						
	Exhaust installation	504.4	504.4	Allows the use of louvers for clothes dryers and allows the use of common plenums (2015)	Retain state amendment but include language that changed in 2018 as last sentence in second paragraph	Agree with staff recommendation	
	504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the *building* and shall be equipped with a backdraft damper located where the duct terminates. Dryer exhaust ducts may terminate at exterior wall louvers with openings spaced not less than ½-inch in any direction. Screens shall not be installed at the duct termination. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or *chimney*. Clothes dryer exhaust ducts shall not extend into or through ducts or *plenums*. **Clothes dryer exhaust ducts shall be sealed in accordance with Section 603.9**. Domestic dryer exhaust ducts may terminate at a common location where each duct has an independent back-draft damper.						
	Common exhaust systems for clothes dryers located in multistory structures	504.11	504.11	Clarification of when and why makeup air is required (2012)	Retain state amendment	Retain amendment	
	504.11 Common exhaust systems for clothes dryers located in multistory structures. Where a common multistory duct system is designed and installed to convey exhaust from multiple clothes dryers, the construction of the system shall be in accordance with all of the following: 1. The shaft in which the duct is installed shall be constructed and fire-resistance rated as required by the *International Building Code*. 2. Dampers shall be prohibited in the exhaust duct. Penetrations of the shaft and ductwork shall be protected in accordance with Section 607.5.5, Exception 2. 3. Rigid metal ductwork shall be installed within the shaft to convey the exhaust. The ductwork shall be constructed of sheet steel having a minimum thickness of 0.0187 inch (0.4712 mm) (No. 26 gage) and in accordance with SMACNA Duct Construction Standards. 4. The ductwork within the shaft shall be designed and installed without offsets. 5. The exhaust fan motor design shall be in accordance with Section 503.2. 6. The exhaust fan motor shall be located outside of the airstream. 7. The exhaust fan shall run continuously, and shall be connected to a standby power source. 8. Exhaust fan operation shall be monitored in an *approved* location and shall initiate an audible or visual signal when the fan is not in operation. 9. *Makeup air* shall be provided for the exhaust system to maintain the minimum flow for the exhaust fan when the dryers are not operating. Additionally, makeup air shall be provided when required by Section 504.7. 10. A cleanout opening shall be located at the base of the shaft to provide *access* to the duct to allow for cleaning and inspection. The finished opening shall be not less than 12 inches by 12 inches (305 mm by 305 mm).						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	11. Screens shall not be installed at the termination. 12. The common multistory duct system shall serve only clothes dryers and shall be independent of other exhaust systems.						
51-52-0505	**Domestic cooking exhaust equipment**						
	Domestic exhaust ducts	505.3	505.3	Deletes the provision allowing natural ventilation in exception 1 (2009) Amendment allows the use of common exhaust duct as long as each duct had a backdraft damper (2015)Allows continuous exhaust with MERV 3 filter to not terminate outdoors (2021)	Retain state amendment but integrate some of the changes from 2018 and 2024 that had nothing to do with the state amendments	Accept staff recommendation	
	505.3 Domestic exhaust ducts. Ducts serving domestic cooking exhaust *equipment* shall discharge to the outdoors through sheet metal ducts constructed of galvanized steel, stainless steel, aluminum or copper. Such ducts shall have smooth inner walls, shall be airtight, ~~and~~ shall be equipped with a backdraft damper, and shall be independent of all other exhaust systems. Installations in Group I-1 and I-2 *occupancies* shall be in accordance with the *International Building Code* and Section 904.14 of the *International Fire Code* and Section 505.7 or 505.8. Domestic kitchen exhaust ducts may terminate with other domestic dryer exhaust and residential local exhaust ducts at a common location where each duct has an independent back-draft damper. Listed and labeled exhaust booster fans shall be permitted when installed in accordance with the manufacturer's installation instructions. **Exceptions:** 1. ~~In other than Group I-1 and I-2 occupancies,~~ Where installed in accordance with the manufacturer's instructions and where ~~mechanical or *natural ventilation* is otherwise provided in accordance with Chapter 4~~continuous local exhaust is provided in an enclosed kitchen in accordance with Table 403.4.7, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors. The local exhaust from the residential dwelling unit or sleeping unit kitchen area may be combined with other exhaust ductwork where the exhaust register/grille in the kitchen is a minimum of 6 feet (1.8 M) from the domestic range cooktop. The exhaust register/grille shall be provided with a minimum MERV 3 filter or mesh filter (washable) for trapping grease. 2. Ducts for domestic kitchen cooking *appliances* equipped with downdraft exhaust systems shall be permitted to be constructed of Schedule 40 PVC pipe and fittings provided that the installation complies with all of the following: 2.1. The duct shall be installed under a concrete slab poured on grade. 2.2. The underfloor trench in which the duct is installed shall be completely backfilled with sand or gravel. 2.3. The PVC duct shall extend not more than 1 inch (25 mm) above the indoor concrete floor surface. 2.4. The PVC duct shall extend not more than 1 inch (25 mm) above grade outside of the *building*. 2.5. The PVC ducts shall be solvent cemented.						
51-52-0506	**Commercial kitchen hood ventilation system duct and exhaust equipment**						
	Vibration isolation	506.3.2.4	506.3.2.4	Correlates the requirements of 506.3.2.3 and 506.3.2.4; ensures there will be product available since there are no	Retain state amendment, include the editorial changes from the 2024 IMC	Agree with staff recommendation	

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
				specific listings for this application (2018)			
	506.3.2.4 Vibration isolation. A vibration isolation connector for connecting a grease duct to a fan shall consist of noncombustible packing in a metal sleeve joint of *approved* design or shall be a coated-fabric flexible grease duct connector ~~*listed* and *labeled* for the application~~rated for continuous duty at temperatures of not less than 1500°F (816°C). Vibration isolation connectors shall be installed only at the connection of a grease duct to a fan inlet or outlet.						
	Grease duct cleanout location	506.3.9, 506.3.9.1, 506.3.9.2	506.3.9, 506.3.9.1, 506.3.9.2	A requirement for cleanout access panels where ducts pass through floors was added (2009), The section was reformatted as a scoping section and two subsections in the 2024 IMC.	Retain state amendment; include the editorial change to item 4 from the 2024 IMC	Agree with staff recommendation	
	506.3.9 Grease duct cleanout location, spacing and installation. **506.3.9.1 Grease duct horizontal cleanouts.** Cleanouts ~~serving~~ located on horizontal sections of grease ducts shall: 1. Be spaced not more than 20 feet (6096 mm) apart. 2. Be located not more than 10 feet (3048 mm) from changes in direction that are greater than 45 degrees (0.79 rad). 3. Be located on the bottom only where other locations are not available and shall be provided with internal damming of the opening such that grease will flow past the opening without pooling. Bottom cleanouts and openings shall be *approved* for the application and installed liquid tight. 4. Not be closer than 1 inch (25 mm) from the edges of the grease duct. 5. Have opening dimensions of not less than 12 inches by 12 inches (305 mm by 305 mm). Where such dimensions preclude installation, the opening shall be not less than 12 inches (305 mm) on one side and shall be large enough to provide *access* for cleaning and maintenance. 6. Be located at grease reservoirs. 7. Be located within 3 feet (914 mm) of horizontal discharge fans. **506.3.9.2 Grease duct vertical cleanouts**. Where ducts pass vertically through floors, cleanouts shall be provided. A minimum of one cleanout shall be provided on each floor. Cleanout openings shall be not less than 1 1/2 inches (38 mm) from all outside edges of the duct or welded seams.						
	Grease duct enclosures	506.3.11	506.3.11	An upper limit was set on the required fire resistance rating so it would not need to be higher than other similar allowed penetrations (2012)	Retain state amendment	Retain amendment	
	Grease duct enclosures. A commercial kitchen grease duct serving a Type I hood that penetrates a ceiling, wall, floor or any concealed space shall be enclosed from the point of penetration to the outlet terminal. In-line exhaust fans not located outdoors shall be enclosed as required for grease ducts. A grease duct shall penetrate exterior walls only at locations where unprotected openings are permitted by the *International Building Code*. The grease duct enclosure shall serve a single grease duct and shall not contain other ducts, piping or wiring systems. Grease duct enclosures shall be a shaft enclosure in accordance with Section 506.3.11.1, a field-applied enclosure assembly in accordance with Section 506.3.11.2 or a factory-built grease duct enclosure assembly in accordance with Section 506.3.11.3. Grease duct enclosures shall have a fire-resistance rating of not less						

<table>
<tr><th>WAC</th><th>Title or Subject</th><th>2021 IMC #</th><th>2024 IMC #</th><th>Rationale</th><th>2024 Staff Recommendation</th><th>2024 TAG Member Recommendation</th><th>Other Comments</th></tr>
<tr><td></td><td colspan="6">than that of the assembly penetrated. The duct enclosure need not exceed 2 hours but ~~and~~ shall not be less than 1 hour. Fire dampers and smoke dampers shall not be installed in grease ducts.</td><td></td></tr>
<tr><td>51-52-0507</td><td colspan="7">Commercial kitchen hoods</td></tr>
<tr><td></td><td>Domestic cooking appliances used for commercial purposes</td><td>507.1.2</td><td>507.1.2</td><td>An amendment with table was added to clarify hood requirements for domestic ranges installed outside of a residential dwelling (2012)</td><td>Retain state amendment</td><td>Retain amendment</td><td></td></tr>
<tr><td></td><td colspan="6">507.1.2 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with ~~either~~ Type I, ~~or~~ Type II or residential hoods as required for the type of appliances and processes in accordance with Table 507.1.2 and Sections 507.2 and 507.3. Domestic cooking appliances utilized for domestic cooking shall comply with Section 505.

TABLE 507.1.2
TYPE OF HOOD REQUIRED FOR DOMESTIC COOKING APPLIANCES
IN THE FOLLOWING SPACES[a, b]
<table><tr><th>Type of Space</th><th>Type of Cooking</th><th>Type of Hood</th></tr><tr><td>Church</td><td>1. Boiling, steaming and warming precooked food
2. Roasting, pan frying and deep frying</td><td>Type II hood
Type I hood</td></tr><tr><td>Community or party room in apartment and condominium</td><td>1. Boiling, steaming and warming precooked food
2. Roasting, pan frying and deep frying</td><td>Residential hood[c] or Type II hood[d]
Type I hood</td></tr><tr><td>Day care</td><td>1. Boiling, steaming and warming precooked food
2. Roasting, pan frying and deep frying</td><td>Residential hood[c] or Type II hood[d]
Type I hood</td></tr><tr><td>Dormitory, boarding home, nursing home</td><td>1. Boiling, steaming and warming precooked food
2. Roasting, pan frying and deep frying</td><td>Type II hood
Type I hood</td></tr><tr><td>Office lunch room</td><td>1. Boiling, steaming and warming precooked food
2. Roasting, pan frying and deep frying</td><td>Residential hood[c] or Type II hood[d]
Type I hood</td></tr></table>a. Commercial cooking appliances shall comply with Section 507.2.
b. Requirements in this table apply to electric or gas fuel appliances only. Solid fuel appliances or charbroilers require Type I hoods.
c. Residential hood shall ventilate to the outside.
d. Type II hood required when more than one appliance is used.</td><td></td></tr>
</table>

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	Type I hoods	507.2	507.2	An exception was added to allow Type II hoods in R-2 boarding homes (2009)	Retain state amendment	Retain amendment	May want to look at a code change to clarify that a hood of some sort is still required; may conflict with Table 507.1.2
	507.2 Type I hoods. Type I hoods shall be installed where cooking *appliances* produce grease or smoke as a result of the cooking process. Type I hoods shall be installed over *medium-duty, heavy-duty* and *extra-heavy-duty cooking appliances*. **Exception:** A Type I hood shall not be required in a Group R-2 type occupancy with not more than 16 residents.						
51-52-0515	**Waste or linen chute venting**						
	Waste or linen chute venting	515	514	Require venting for trash and laundry chutes consistent with NFPA 82-2014 (2015)	Retain state amendment	Retain amendment and renumber	There has been no change to NFPA 82 for the 2024 edition
	SECTION ~~515~~514—WASTE OR LINEN CHUTE VENTING **~~515.1~~ 514.1 General.** Waste or linen chutes shall be gravity vented in accordance with NFPA 82. **Exception:** Waste or linen chutes may be mechanically ventilated by an exhaust fan in accordance with Section 713.13.7 of the International Building Code.						
Chapter 6 Duct Systems							
51-52-0601	**General**						
	Air movement in egress elements	601.2	601.2	Adds an exception for engineered smoke control system; Requirements for residential corridor ventilation (2003 and before)	Retain state amendment but update IFC section reference in 6.4	Agree with staff recommendation	
	601.2 Air movement in egress elements. Corridors shall not serve as supply, return, exhaust, relief or *ventilation air* ducts. **Exceptions:** 1. Use of a corridor as a source of *makeup air* for exhaust systems in rooms that open directly onto such corridors, including toilet rooms, bathrooms, dressing rooms, smoking lounges and janitor closets, shall be permitted, provided that each such corridor						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	is directly supplied with outdoor air at a rate greater than the rate of *makeup air* taken from the corridor. 2. Where located within a *dwelling unit*, the use of corridors for conveying return air shall not be prohibited. 3. Where located within tenant spaces of 1,000 square feet (93 m^2) or less in area, use of corridors for conveying return air is permitted. 4. Transfer air movement required to maintain pressurization difference within health care facilities in accordance with ASHRAE 170. 5. Where such air is part of an engineered smoke control system 6. Air supplied to corridors serving residential occupancies shall not be considered as providing ventilation air to the dwelling units and sleeping units subject to the following: 6.1. The air supplied to the corridor is 100% outside air, and 6.2. The units served by the corridor have conforming ventilation air independent of the air supplied to the corridor, and 6.3. For other than high-rise buildings, the supply fan will automatically shut off upon activation of corridor smoke detectors installed in accordance with Section 606.2.4; or 6.4. For high-rise buildings, the supply fan will automatically shut off upon activation of the smoke detectors required by Section 907.2.13.1 of the International Fire Code or upon receipt of another approved fire alarm signal. The supply fan is not required to be automatically shut off when used as part of an approved building stairwell or elevator hoistway pressurization system. Corridor smoke detectors shall be installed in accordance with Section 606.2.5.					
51-52-0602	**Plenums**						
	General	602.1	602.1.2	Clarification that the requirement pertains to systems that serve multiple areas (2015)	Retain state amendment and renumber and reformat per the model code change	Agree with staff recommendation with cleanup	reference to WSEC C on use of cavities as plenums? check for conflict
	602.1 General. Supply, return, exhaust, relief and *ventilation air plenums* shall be in accordance with this section. ~~Fuel-fired *appliances* shall not be installed within a *plenum*.~~ **602.1.1 Locations limited.** *Plenums* shall be limited to uninhabited crawl spaces, above a ceiling or below the floor, attic spaces, and mechanical equipment rooms ~~and the framing cavities~~ addressed in Section 602.2. **602.1.2 Limited to a fire area.** *Plenums* shall be limited to one fire area. Air systems that serve multiple fire areas shall be ducted ~~directly~~ from the boundary of the fire area served directly to the air-handling equipment. **602.1.3 Fuel-fired appliances.** Fuel-fired *appliances* shall not be installed within a *plenum*.						
51-52-0603	**Duct construction and installation**						
	Gypsum ducts	603.5.1	603.5.1	Exception added to allow the use of gyp board air shafts in pressurization systems (2009 but was carried over from the VIAQ code)	Retain state amendment	Retain amendment	

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	603.5.1 Gypsum ducts. The use of gypsum boards to form air shafts (ducts) shall be limited to return air systems where the air temperatures do not exceed 125°F (52°C) and the gypsum board surface temperature is maintained above the airstream dew- point temperature. Supply air ducts formed by gypsum boards shall not be incorporated in air-handling systems utilizing *direct evaporative cooling* systems. **Exception:** In other than Group I-2 occupancies, gypsum boards may be used for ducts that are only used for stairwell or elevator pressurization supply air. The gypsum duct shall not attach directly to the equipment.						
51-52-0605	**Air filters**						
	General	605.1	605.1	Started specifying a MERV rating in 2012 code. Added amendment for chilled beams in 2015. Current format and exceptions adopted for 2021 code.	Retain state amendment	Retain amendment	
	605.1 General. ~~Heating and air-conditioning~~ Air handlers and ventilation systems shall be provided with *approved* air filters in accordance with Section 605.4. Filters shall be installed such that all return air, recirculated air, outdoor air and *makeup air* is filtered upstream from any heat exchanger or coil. Filters shall be installed in an *approved* convenient location. Liquid adhesive coatings used on filters shall have a flash point not lower than 325°F (163°C). **Exceptions:** 1. Cooling coils that are designed, controlled and operated to provide sensible cooling only do not require filtration at the terminal device. 2. Ambient air that enters the building through intentional openings for natural ventilation or by infiltration is not required to be filtered. ~~1.~~3. Recirculated air serving systems without wetted cooling coils or with unducted heater (hydronic coils, fossil fuel heating elements or electric resistance heating elements) do not required filtration at the terminal device.						
	Particulate matter removal	605.4	605.4	Moved the filter requirement to a separate new section for 2015 code. Current filter requirements and exceptions adopted for 2021 code.	Retain state amendment	Retain amendment	
	605.4 Particulate matter removal. Particulate matter filters or air cleaners shall have a minimum efficiency reporting value (MERV) of not less than the following: 1. MERV 13 for ducted air handlers and ventilation systems serving occupiable spaces in Groups A, B, E, M, R and I occupancies. 2. MERV 8 for ducted air handlers and ventilation systems serving occupiable spaces in Groups F, H, S, and U occupancies. 3. MERV 4 for unducted air handlers and fan coil units. **Exceptions:** 1. Ducted air handlers and ventilation systems 500 cfm or less shall have a filter not less than MERV 8. 2. Recirculated air at fan powered variable air volume terminal units with hydronic heating coils or electric resistance heating elements shall have a filter not less than MERV 8. ~~1.~~3. Exhaust or relief air upstream of a heat exchanger or coil shall have a filter not less than MERV 6.						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
51-52-0606	**Smoke detection systems control**						
	Return air systems	606.2.1	606.2.1	Second exception added for supply or return air for DOAS as the air is not recirculated to other portions of the building (2015)	Retain state amendment	Retain amendment	
	606.2.1 Return air systems. Smoke detectors shall be installed in return air systems with a design capacity greater than 2,000 cfm (0.9 m^3/s), in the return air duct or *plenum* upstream of any filters, *exhaust air* connections, outdoor air connections, or decontamination *equipment* and *appliances*. **Exceptions:** 1. Smoke detectors are not required in the return air system where all portions of the *building* served by the air distribution system are protected by area smoke detectors connected to a fire alarm system in accordance with the *International Fire Code*. The area smoke detection system shall comply with Section 606.4. ~~1.~~2. Smoke detectors are not required in the air system where all of the air is exhausted and not recirculated back to any portion of the building. Additionally, smoke detectors are not required in the supply system that provides the makeup air for the exhaust system.						
	Common supply and return air systems	606.2.2	606.2.2	Clarification on control systems for fan powered terminal units (2009)	Retain state amendment	Retain amendment	
	606.2.2 Common supply and return air systems. Where multiple air-handling systems share common supply or return air ducts or *plenums* with a combined design capacity greater than 2,000 cfm (0.9 m^3/s), the return air system shall be provided with smoke detectors in accordance with Section 606.2.1. **Exception:** Individual smoke detectors shall not be required for each fan-powered terminal unit, provided that such units do not have an individual design capacity greater than 2,000 cfm (0.9 m^3/s) and will be shut down by activation of one of the following: 1. Smoke detectors required by Sections 606.2.1 and 606.2.3. 2. An *approved* area smoke detector system located in the return air *plenum* serving such units. 3. An area smoke detector system as prescribed in the exception to Section 606.2.1. In all cases, the smoke detectors shall comply with Sections 606.4 and 606.4.1. The shutdown of fan-powered terminal units may be performed by a building automation system upon activation of smoke detection as described in Section 606.2.2, Exception items 1, 2 or 3. The building automation system is not required to be listed as a smoke control system and is not required to comply with UL Standard 864.						
	Corridors serving Group R occupancies in other than high-rise buildings	606.2.4	606.2.4	Correlating residential smoke control with the exceptions in 601.2 (2018)	Retain state amendment	Retain amendment	

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	606.2.4 Corridors serving Group R occupancies in other than high-rise buildings. Corridors that serve Group R occupancies in other than high-rise buildings and that are mechanically ventilated with supply air shall be equipped with smoke detectors spaced in accordance with NFPA 72. The supply fan shall automatically shut off upon activation of the corridor smoke detectors. **Exception:** Corridor smoke detection is not required when air is returned back to the supply fan from the corridor and return air smoke detectors are installed in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances designed to automatically shut off the supply fan.						
	Corridors serving Group R occupancies in high-rise buildings	606.2.5	606.2.5	Correlating residential smoke control with the exceptions in 601.2 (2018)	Retain state amendment	Retain amendment	
	606.2.5 Corridors serving Group R occupancies in high-rise buildings. Corridors that serve Group R occupancies in high-rise buildings and that are mechanically ventilated with supply air shall be equipped with smoke detectors that are spaced in accordance with NFPA 72 and air supply inlets to the corridor shall be provided with smoke/fire dampers. The supply inlet smoke/fire dampers shall automatically close upon activation of the corridor smoke detectors. **Exceptions:** 1. Corridor smoke detection is not required to close the supply inlet smoke/fire dampers when the smoke/fire dampers are used as part of an approved building stairwell or elevator hoistway pressurization smoke control system. ~~1.~~2. Corridor smoke detection is not required when air is returned back to the supply fan from the corridor and return air smoke detectors are installed in the return air duct or plenum upstream of any filters, exhaust air connections, outdoor air connections, or decontamination equipment and appliances designed to automatically shut off the supply fan.						
51-52-0607	**Ducts and transfer openings**						
	Fire barriers	607.5.2	607.5.2	Allows for flexible connections when air handling equipment is outside or when connecting to a diffuser in the same room (2021)	Retain state amendment	Retain amendment	
	607.5.2 Fire barriers. Ducts and air transfer openings that penetrate fire barriers shall be protected with *listed* fire dampers installed in accordance with their listing. Ducts and air transfer openings shall not penetrate enclosures for interior exit stairways and ramps and exit passageways except as permitted by Sections 1023.5 and 1024.6, respectively, of the *International Building Code*. **Exception:** Fire dampers are not required at penetrations of fire barriers where any of the following apply: 1. Penetrations are tested in accordance with ASTM E119 or UL 263 as part of the fire-resistance-rated assembly. 2. Ducts are used as part of an *approved* smoke control system in accordance with Section 512 and where the fire damper would interfere with the operation of the smoke control system. 3. Such walls are penetrated by fully ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, are in areas of other than Group H and are in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the *International Building Code*. For the purposes of this exception, a fully ducted HVAC system shall be a duct system for the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage [0.0217 inch (0.55 mm)] thickness and shall be continuous from the air-handling *appliance* or *equipment* to the air outlet and inlet terminals. Flexible air connectors shall be permitted in a fully ducted system, limited to the following installations: 3.1. Nonmetallic flexible connections that connect a duct to an air handling unit or *equipment* located within a mechanical room						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	or located outdoors in accordance with Section 603.9. 3.2. Nonmetallic flexible air connectors in accordance with Section 603.6.2 that connect an overhead metal duct to a ~~ceiling~~ diffuser, grille or register where the metal duct and ~~ceiling~~ diffuser, grille or register are located within the same room.						
	Fire partitions	607.5.3	607.5.3	Allows for flexible connections when air handling equipment is outside or when connecting to a diffuser in the same room (2021)	Retain state amendment	Agree with staff recommendation	
	607.5.3 Fire partitions. Ducts and air transfer openings that penetrate fire partitions shall be protected with *listed* fire dampers installed in accordance with their listing. **Exception:** In *occupancies* other than Group H, fire dampers are not required where any of the following apply: 1. Corridor walls in *buildings* equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the *International Building Code* and the duct is protected as a through penetration in accordance with Section 714 of the *International Building Code*. 2. The partitions are tenant partitions in covered and open mall *buildings* where the walls are not required by provisions elsewhere in the *International Building Code* to extend to the underside of the floor or roof sheathing, slab or deck above. 3. The duct system is constructed of *approved* materials in accordance with Section 603 and the duct penetrating the wall complies with all of the following requirements: 3.1. The duct shall not exceed 100 square inches (0.06 m^2). 3.2. The duct shall be constructed of steel not less than 0.0217 inch (0.55 mm) in thickness. 3.3. The duct shall not have openings that communicate the corridor with adjacent spaces or rooms. 3.4. The duct shall be installed above a ceiling. 3.5. The duct shall not terminate at a wall register in the fire-resistance-rated wall. 3.6. A minimum 12-inch-long (305 mm) by 0.060-inch-thick (1.52 mm) steel sleeve shall be centered in each duct opening. The sleeve shall be secured to both sides of the wall and all four sides of the sleeve with minimum $1^1/_2$-inch by $1^1/_2$-inch by 0.060-inch (38 mm by 38 mm by 1.52 mm) steel retaining angles. The retaining angles shall be secured to the sleeve and the wall with No. 10 (M5) screws. The annular space between the steel sleeve and the wall opening shall be filled with rock (mineral) wool batting on all sides. 4. Such walls are penetrated by fully ducted HVAC systems, have a required fire-resistance rating of 1 hour or less, and are in areas of other than Group H and are in *buildings* equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 of the *International Building Code*. For the purposes of this exception, a fully ducted HVAC system shall be a duct system for conveying supply, return or *exhaust air* as part of the structure's HVAC system. Such a duct system shall be constructed of sheet steel not less than 26 gage in thickness and shall be continuous from the air-handling *appliance* or *equipment* to the air outlet and inlet terminals. Flexible air connections shall be permitted in a fully ducted system, limited to the following installations: 4.1. Nonmetallic flexible connections that connect a duct to an air-handling unit or equipment located within a mechanical room or located outdoors in accordance with Section 603.9. ~~3.7.~~4.2. Nonmetallic flexible air connectors in accordance with Section 603.2.6 that connect an overhead metal duct to a diffuser, grille or register where the metal duct and diffuser, grille or register are located in the same room. Where the fully ducted HVAC system metal ductwork penetrates a corridor fire partition, the ductwork shall be continuous without openings to the corridor,						

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	to a mechanical room, or to a shaft enclosure.						
Chapter 9 Specific Appliances, Fireplaces and Solid Fuel-Burning Equipment							
51-52-0915	**Engine and gas turbine-powered equipment and appliances**						
	Installation of emergency and legally required power systems	915.3 thru 915.3.2	915.3 thru 915.3.2	Brings in requirements from NFPA for standby power as required by IBC (2021)	Retain state amendment	Retain state amendment	Review and possible amendment of 915.3.2 item 2
	915.3 Installation of emergency and legally required power systems. Emergency power systems and legally required standby power systems required by the *International Building Code* or *International Fire Code* shall be installed in accordance with the *International Fire Code*, NFPA 70, NFPA 110, and NFPA 111. **915.3.1 Air intakes.** Air intake opening locations for combustion and radiator cooling intake air shall be located on the exterior of the building in accordance with NFPA 110 and a minimum of 5 feet from the property line. **915.3.2 Air outlets.** Air outlet opening locations shall comply with the following: 1. Combustion exhaust shall be located on the exterior of the building in accordance with Section 501.3.1 Item 2 for product conveying exhaust. 2. Radiator cooling outlet air shall be located on the exterior of the building in accordance with NFPA 110, a minimum of 5 feet from the property line and a minimum of 2 feet above grade.						
	Installation of optional standby power systems	915.4 thru 914.3.2	915.4 thru 914.3.2	Brings in requirements from NFPA for standby power when not required by IBC (2021)	Retain state amendment	Retain state amendment	
	915.4 Installation of optional standby power systems. Optional standby power systems shall be installed in accordance with the *International Fire Code*, NFPA 37, NFPA 70, and NFPA 111 as applicable. **915.4.1 Air intakes.** Air intake opening locations for combustion and radiator cooling intake air shall be located on the exterior of the building in accordance with NFPA 110 and a minimum of 5 feet from the property line and may be located within an open or enclosed parking garage with sufficient exterior permanent opening area to provide the intake air. **915.4.2 Air outlets.** Air outlet opening locations shall comply with the following: 1. Combustion exhaust shall be located on the exterior of the building in accordance with Section 501.3.1 Item 2 for product conveying exhaust. ~~1.~~2. Radiator cooling outlet air shall be located a minimum of 5 feet from the property line and may be discharged into an open or enclosed parking garage with sufficient exterior permanent opening area to relieve heat from the generator.						
Chapter 10 Boilers, Water Heaters and Pressure Vessels							
51-52-1000	**Boilers, water heaters and pressure vessels**						

<table>
<tr><th>WAC</th><th>Title or Subject</th><th>2021 IMC #</th><th>2024 IMC #</th><th>Rationale</th><th>2024 Staff Recommendation</th><th>2024 TAG Member Recommendation</th><th>Other Comments</th></tr>
<tr><td></td><td>Scope</td><td>1001.1</td><td>1001.1</td><td>Changed "state inspectors" to "state inspection programs" for consistency with WA practices (2003)</td><td>Retain state amendment</td><td>Retain state amendment</td><td></td></tr>
<tr><td></td><td colspan="5">Informational note: Boilers and pressure vessels are regulated by Chapter 70.79 RCW and Chapter 296.104 WAC in addition to the requirements of this code.

1001.1 Scope. This chapter shall govern the installation, alteration and repair of boilers, water heaters and pressure vessels.
Exceptions:
1. Pressure vessels used for unheated water supply.
2. Portable unfired pressure vessels and Interstate Commerce Commission containers.
3. Containers for bulk oxygen and medical gas.
4. Unfired pressure vessels having a volume of 5 cubic feet (0.14 m^3) or less operating at pressures not exceeding 250 pounds per square inch (psi) (1724 kPa) and located within occupancies of Groups B, F, H, M, R, S and U.
5. Pressure vessels used in refrigeration systems that are regulated by Chapter 11 of this code.
6. Pressure tanks used in conjunction with coaxial cables, telephone cables, power cables and other similar humidity control systems.
7. Any boiler or pressure vessel subject to inspection by federal or state ~~inspectors~~inspection programs.
8. Pressure vessels used in specific appliances and equipment that are regulated by Chapter 9 of this code.</td><td></td></tr>
<tr><td colspan="8">Chapter 11 Refrigeration</td></tr>
<tr><td>51-52-1106</td><td colspan="7">Machinery room, special requirements</td></tr>
<tr><td></td><td>Emergency ventilation system</td><td>1106.4.2</td><td>NA</td><td>This amendment was added to include ASHRAE 15 and A2L refrigerants (2018)</td><td>Repeal state amendment; no longer needed with the rewrite of 1106 to correlate with ASHRAE 15</td><td>Repeal state amendment</td><td></td></tr>
<tr><td></td><td colspan="5">~~1106.4.2 Emergency ventilation system.~~ ~~An emergency ventilation system shall be provided at the minimum exhaust rate specified in ASHRAE 15 or Table 1106.4.2. Shutdown of the emergency ventilation system shall be by manual means.~~
~~Table 1106.4.2~~
~~MINIMUM EXHAUST RATES~~
<table><tr><th>~~Refrigerant~~</th><th>~~Q(m/sec)~~</th><th>~~Q(cfm)~~</th></tr><tr><td>~~R32~~</td><td>~~15.4~~</td><td>~~32,600~~</td></tr><tr><td>~~R143A~~</td><td>~~13.6~~</td><td>~~28,700~~</td></tr><tr><td>~~R444A~~</td><td>~~6.46~~</td><td>~~13,700~~</td></tr><tr><td>~~R444B~~</td><td>~~10.6~~</td><td>~~22,400~~</td></tr><tr><td>~~R445A~~</td><td>~~7.83~~</td><td>~~16,600~~</td></tr></table></td><td></td></tr>
</table>

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments

~~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~~

1106.4 Group A2L and B2L refrigerants. *Machinery rooms* for Group A2L and B2L refrigerants shall comply with Sections 1106.4.1 through 1106.4.3.

1106.4.1 Elevated temperatures. Open flame-producing devices or continuously operating hot surfaces over 1290°F (700°C) shall not be permanently installed in the room.

1106.4.2 Refrigerant detector. In addition to the requirements of Section 1105.3, refrigerant detectors shall signal an alarm and activate the ventilation system in accordance with the response time specified in Table 1106.4.2.

TABLE 1106.4.2

TABLE 1106.4.2—GROUP A2L and B2L DETECTOR ACTIVATION

ACTIVATION LEVEL	MAXIMUM RESPONSE TIME (seconds)	ASHRAE 15 VENTILATION (seconds)	ALARM RESET	ALARM TYPE
Less than or equal to the OEL in Table 1103.1	300	1	Automatic	Trouble
Less than or equal to the refrigerant concentration level in Table 1103.1	15	2	Manual	Emergency

1106.4.3 Mechanical ventilation. The *machinery room* shall have a mechanical ventilation system complying with ASHRAE 15.

Chapter 12 Hydronic Piping

51-52-1200 Hydronic piping

	Insulation and thermal break required	1209.5	1209.5	References the energy code for insulation requirements (2015)	Retain state amendment	Retain state amendment	May want to look at modification to just point to the energy code

1209.5 Insulation and thermal break required. Radiant floor heating and snow melt systems shall be provided with insulation and a thermal break in accordance with Sections 1209.5.1 and 1209.5.2. ~~Insulation *R* values for slab-on-grade and suspended floor installation shall be in accordance with the *International Energy Conservation Code*.~~ Concrete slab-on-grade, asphalt and paver-system type pavements shall have a minimum of R-10 insulation installed under the area to be snow melted, or R-5 insulation shall be installed under and at the slab edges of the area to be snow melted. The insulation shall be located underneath the snow and ice melt hydronic piping or cable and along all edges of the pavement where the snow and ice melt system is installed in accordance with the snow and ice melt manufacturer's instructions. Insulation R-values for slab-on-grade and suspended floor insulation shall be in accordance with the Washington State Energy Code.

~~**Exception:** Insulation shall not be required in engineered systems where it can be demonstrated that the insulation will decrease the~~

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	~~efficiency or have a negative effect on the installation.~~						
	Expansion tanks	1210.7.6	1210.7.6	Require a means of drainage for expansion tanks downstream of shutoff valves (2015)	Retain state amendment	Retain state amendment	Look at proposal to remove the amendment or modify the language
	1210.7.6 Expansion tanks. Shutoff valves shall be installed at connections to ~~nondiaphragm type~~ expansion tanks. A method of draining the expansion tank downstream of the shutoff valve shall be provided.						
Chapter 13 Fuel Oil Piping and Storage							
51-52-1305	**Fuel oil system installation**						
	Vent piping	1305.7	1305.7	Amended to be consistent with NFPA 30 (2021)	Retain state amendment	Retain state amendment	Need to confirm the standard language hasn't changed
	1305.7 Vent piping. Liquid fuel vent pipes shall terminate outside of buildings at a point not less than ~~2~~ 5 feet (~~610~~ 1524 mm) ~~measured vertically or horizontally from any building opening~~from building openings and not less than 15 feet (4572 mm) from outdoor air intakes. Outer ends of vent pipes shall terminate in a weatherproof vent cap or fitting or be provided with a weatherproof hood. Vent caps shall have a minimum free open area equal to the cross-sectional area of the vent pipe and shall not employ screens finer than No. 4 mesh. Vent pipes shall terminate sufficiently above the ground to avoid being obstructed with snow or ice. Vent pipes from tanks containing heaters shall be extended to a location where oil vapors discharging from the vent will be readily diffused. If the static head with a vent pipe filled with oil exceeds 10 pounds per square inch (psi) (69 kPa), the tank shall be designed for the maximum static head that will be imposed. Liquid fuel vent pipes shall not be cross connected with fill pipes, lines from burners or overflow lines from auxiliary tanks. **Exception:** Liquid fuel vent pipes may terminate outside the building at a point not less than 2 feet from the fuel oil equipment combustion exhaust outlet.						
Chapter 15 Referenced Standards							
51-52-1500	**Referenced standards**						
	AHAM Directory, HRH2 range hoods				Retain amendment and update if available	Retain amendment	
	ANCE/CSA/UL 60335-2-40-2019				Delete state amendment, accept Model Code language	Delete amendment	This may have already been changed via expedited or other

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
					referencing the 2022 edition		rulemaking before adoption of 2024 code
	ASHRAE 62.2				Retain amendment and update if available	Retain amendment	
	ASTM E3087				Retain amendment and update if available	Retain amendment	
	CSA/UL.ANCE 60335-2-40-2019				Delete state amendment, accept Model Code language referencing the 2022 edition	Delete amendment	
	HVI Ventilating Product Directory				Retain amendment and update if available	Retain amendment	
	HVI Loudness test for residential fans				Retain amendment and update if available	Retain amendment	
	HVI air flow test				Retain amendment and update if available	Retain amendment	
	HVI Product certification procedure				Retain amendment and update if available	Retain amendment	
	NFPA 110 Standard for emergency and standby power				Retain amendment and update if available	Retain amendment	
	NFPA 111 Standard on stored emergency and standby power				Retain amendment and update if available	Retain amendment	
	UL 864 Control units for fire alarm systems				Retain amendment and update if available	Retain amendment	

WAC	Title or Subject	2021 IMC #	2024 IMC #	Rationale	2024 Staff Recommendation	2024 TAG Member Recommendation	Other Comments
	UL/CSA/ANCE 60335-2-40-2019				Delete state amendment, accept Model Code language referencing the 2022 edition	Delete amendment	

TABLE 403.3.1.1—MINIMUM VENTILATION RATES

OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY #/1000 FT^{2} [a]	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} [a]	EXHAUST AIRFLOW RATE CFM/FT^{2} [a]
Animal facilities				
Animal exam room (veterinary office)	20	10	0.12	—
Animal imaging (MR/CT/PET)	20	10	0.18	0.9
Animal operating rooms	20	10	0.18	3.00
Animal postoperative recovery room	20	10	0.18	1.50
Animal preparation rooms	20	10	0.18	1.50
Animal procedure room	20	10	0.18	2.25
Animal surgery scrub	20	10	0.18	1.50
Large-animal holding room	20	10	0.18	2.25
Necropsy	20	10	0.18	2.25
Small-animal cage room (static cages)	20	10	0.18	2.25
Small-animal cage room (ventilated cages)	20	10	0.18	1.50
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	—

TABLE 403.3.1.1—MINIMUM VENTILATION RATES				
OCCUPANCY CLASSIFICATION	**OCCUPANT DENSITY #/1000 FT^{2} [a]**	**PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON**	**AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} [a]**	**EXHAUST AIRFLOW RATE CFM/FT^{2} [a]**
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 5–8)	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	—
Break rooms	25	5	0.06	—
Cafeteria, fast food	100	7.5	0.18	—
Coffee stations	20	5	0.06	—

TABLE 403.3.1.1—MINIMUM VENTILATION RATES				
OCCUPANCY CLASSIFICATION	**OCCUPANT DENSITY #/1000 FT^{2} [a]**	**PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON**	**AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} [a]**	**EXHAUST AIRFLOW RATE CFM/FT^{2} [a]**
Corridors	—	—	0.06	—
Dining rooms	70	7.5	0.18	—
Kitchens (cooking)[b]	20	7.5	0.12	0.7
Occupiable storage rooms for liquids or gels	2	5	0.12	—
Hotels, motels, resorts and dormitories				
Bathrooms/toilet—private[g]	—	—	—	25/50f
Bedroom/living room	10	5	0.06	—
Conference/meeting	50	5	0.06	—
Dormitory sleeping areas	20	5	0.06	—
Gambling casinos	120	7.5	0.18	—
Laundry rooms, central	10	5	0.12	—
Laundry rooms within dwelling units	10	5	0.12	—
Lobbies/prefunction	30	7.5	0.06	—
Multipurpose assembly	120	5	0.06	—
Offices				
Break rooms	50	5	0.12	—
Conference rooms	50	5	0.06	—
Kitchenettes[n]	25	5	0.06	0.30
Main entry lobbies	10	5	0.06	—
Occupiable storage rooms for dry materials	2	5	0.06	—
Office spaces	5	5	0.06	—
Reception areas	30	5	0.06	—
Telephone/data entry	60	5	0.06	—
Outpatient healthcare facilities[i,j]				
Birthing room	15	10	0.18	—
Class 1 imaging room	5	5	0.12	—
Dental operatory[k]	20	10	0.18	—
General examination room	20	7.5	0.12	—
Other dental treatment areas	5	5	0.06	—
Physical therapy exercise area	7	20	0.18	—
Physical therapy individual room	20	10	0.06	—

TABLE 403.3.1.1—MINIMUM VENTILATION RATES				
OCCUPANCY CLASSIFICATION	**OCCUPANT DENSITY #/1000 FT^2 [a]**	**PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON**	**AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^2 [a]**	**EXHAUST AIRFLOW RATE CFM/FT^2 [a]**
Physical therapeutic pool area	—	—	0.48	—
Prosthetics and orthotics room	20	10	0.18	—
Psychiatric consultation room	20	5	0.06	—
Psychiatric examination room	20	5	0.06	—
Psychiatric group room	50	5	0.06	—
Psychiatric seclusion room	5	10	0.06	—
Speech therapy room	20	5	0.06	—
Urgent care examination room	20	7.5	0.12	—
Urgent care observation room	20	5	0.06	—
Urgent care treatment room	20	7.5	0.18	—
Urgent care triage room	20	10	0.18	—
Private dwellings, single and multiple				
Garages, common for multiple units[b]	—	—	—	0.75
Kitchens[b]	—	—	—	~~50/100f~~See Table 403.4.7
Living areas[c]	~~Based on number of bedrooms. First bedroom, 2; each additional bedroom, 1~~ —	~~0.35 ACH but not less than 15 cfm/person~~See Table 403.4.2	—	—
Toilet rooms and bathrooms[g]	—	—	—	~~25/50f~~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	—	—	—	1.0
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	—

TABLE 403.3.1.1—MINIMUM VENTILATION RATES				
OCCUPANCY CLASSIFICATION	**OCCUPANT DENSITY #/1000 FT^2 [a]**	**PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON**	**AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^2 [a]**	**EXHAUST AIRFLOW RATE CFM/FT^2 [a]**
Museums/galleries	40	7.5	0.06	—
Places of religious worship	120	5	0.06	—
Room with adult changing station	—	—	—	50/70e
Shower room (per shower head)[g]	—	—	—	50/20f
Smoking lounges[b]	70	60	—	—
Toilet rooms — public[g]	—	—	—	50/70e
Retail stores, sales floors and show-room 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
Banks or lobbies	15	7.5	0.06	—
Barber	25	7.5	0.06	0.5
Beauty salons[b]	25	20	0.12	0.6
Embalming room[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				
Bowling alleys (seating areas)	40	10	0.12	—
Disco/dance floors	100	20	0.06	—
Game arcades	20	7.5	0.18	—
Gym, stadium, arena (play area)	7	20	0.18	—
Health club/aerobics room	40	20	0.06	—
Health club/weight room	10	20	0.06	—
Ice arenas without combustion engines[m]	—	—	0.30	0.5

TABLE 403.3.1.1—MINIMUM VENTILATION RATES				
OCCUPANCY CLASSIFICATION	**OCCUPANT DENSITY #/1000 FT^{2} [a]**	**PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON**	**AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT^{2} [a]**	**EXHAUST AIRFLOW RATE CFM/FT^{2} [a]**
Spectator areas	150	7.5	0.06	—
Swimming pools (pool and deck area)	—	—	0.48	—
Storage				
Janitor closets, trash rooms, recycling rooms				1.0
Refrigerated warehouses/ freezers (< 50°F)	—	10	—	—
Repair garages, enclosed parking garages[b,d]	—	—	—	0.75
Storage rooms, chemical				1.5
Warehouses[l]	—	10	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	—
Computer (without printing)	4	5	0.06	—
Copy, printing rooms	4	5	0.06	0.5
Darkrooms	—	—	—	1.0
Freezer and refrigerated spaces (<50°F)	—	10	—	—
Manufacturing where hazardous materials are not used	7	10	0.18	—
Manufacturing where hazardous materials are used (excludes heavy industrial and chemical processes)	7	10	0.18	—
Meat processing[c]	10	15	—	—
Pharmacy (prep. area)	10	5	0.18	—
Photo studios	10	5	0.12	—
Sorting, packing, light assembly	7	7.5	0.12	—
Telephone closets	—	—	0.00	—

TABLE 403.3.1.1—MINIMUM VENTILATION RATES				
OCCUPANCY CLASSIFICATION	**OCCUPANT DENSITY #/1000 FT$^{2\,a}$**	**PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_p CFM/PERSON**	**AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE, R_a CFM/FT$^{2\,a}$**	**EXHAUST AIRFLOW RATE CFM/FT$^{2\,a}$**

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

a. Based on 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, urinal or adult changing station. 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. Outpatient facilities to which the rates apply are freestanding birth centers, urgent care centers, neighborhood clinics and physicians' offices, Class 1 imaging facilities, outpatient psychiatric facilities, outpatient rehabilitation facilities and outpatient dental facilities.

j. The requirements of this table provide for acceptable IAQ. The requirements of this table do not address the airborne transmission of airborne viruses, bacteria and other infectious contagions.

k. These rates are intended only for outpatient dental clinics where the amount of nitrous oxide is limited. They are not intended for dental operatories in institutional buildings where nitrous oxide is piped.

l. The occupiable floor area in warehouses shall not include the floor area of self-storage units, floor areas under rack storage or designated palletized storage floor areas.

m. When combustion equipment is intended to be used on the playing surface, additional dilution ventilation and/or source control shall be provided.

~~l.~~n. 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.

403.4 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 the Group R occupancy shall meet the natural ventilation 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.

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.

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

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 403.4.2
WHOLE HOUSE MECHANICAL VENTILATION AIRFOW RATE
(CONTINUOUSLY OPERATING SYSTEM)

Floor area (ft^2)	Bedrooms[1]				
	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. Minimum airflow (Qr) is set at not less than 30 cfm for each dwelling unit.

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 403.4.2

C_{system} = System coefficient from Table 403.4.3

TABLE 403.4.3
SYSTEM COEFFICIENT (C_{system})

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

403.4.4 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 403.4.6 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 system controls. Controls for the whole house ventilation system shall comply with the following:

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 have ready access for the occupant.
2. The 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 have 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 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 the *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 at 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, balanced 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.