

APPENDIX B
WHOLE BUILDING VENTILATION SYSTEM SPECIFICATIONS

B100 SCOPE AND APPLICABILITY

B101.1 Applicability of Appendix B. Appendix B is part of this standard.

B101.2 Scope. The provisions contained in Appendix B provide the specifications necessary for complying with Section 902.2.1 for the installation of whole building ventilation systems. To receive points for implementing Practice 902.2.1, the chosen whole building ventilation system is to be in accordance with the applicable specifications of Appendix B.

B191.3 Acknowledgment. The text of Appendix B, Section B200 and related Tables are extracted from ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) Standard 62.2-2010 *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, Section 4, and is used with the permission of ASHRAE. The referenced Section and Table numbers within the extracted text are modified to be applicable to Appendix B of this Standard. "*" indicates added reference to ICC or ASHREA 62.2 to provide clarity.

B200 WHOLE-BUILDING VENTILATION

B201.1 Ventilation Rate. A mechanical exhaust system, supply system, or other combination thereof shall be installed for each dwelling unit to provide whole-building ventilation with outdoor air each hour at no less than the rate specified in Tables B201.1a and B201.1b or, equivalently, Equations B201.1a and B201.1b, based on the floor area of the conditioned space and number of bedrooms.

B201.1.2 Alternative Ventilation. Other methods may be used to provide the required ventilation rates (of Tables B201.1a and B201.1b) when approved by a licensed design professional.

Equation B201.1a

$$Q_{fan} = 0.01A_{floor} + 7.5(N_{br} + 1)$$

where

Q_{fan} = fan flow rate, cfm

A_{floor} = floor area, ft²

N_{br} = number of bedrooms; not to be less than one

Equation B201.1b

$$Q_{fan} = 0.05A_{floor} + 3.5(N_{br} + 1)$$

where

Q_{fan} = fan flow rate, L/s

A_{floor} = floor area, m²

N_{br} = number of bedrooms; not to be less than one

TABLE B201.1a (I-P)
Ventilation Air Requirements, cfm

| Floor Area (ft ²) | Bedrooms | | | | |
|----------------------------------|----------|-----|-----|-----|-----|
| | 0-1 | 2-3 | 4-5 | 6-7 | >7 |
| <1500 | 30 | 45 | 60 | 75 | 90 |
| 1501-3000 | 45 | 60 | 75 | 90 | 105 |
| 3001-4500 | 60 | 75 | 90 | 105 | 120 |

| | | | | | |
|-----------|-----|-----|-----|-----|-----|
| 4501-6000 | 75 | 90 | 105 | 120 | 135 |
| 6001-7500 | 90 | 105 | 120 | 135 | 150 |
| >7500 | 105 | 120 | 135 | 150 | 165 |

TABLE B201.1b (SI)
Ventilation Air Requirements, L/s

| Floor Area (m ²) | Bedrooms | | | | |
|---------------------------------|----------|-----|-----|-----|----|
| | 0-1 | 2-3 | 4-5 | 6-7 | >7 |
| <139 | 14 | 21 | 28 | 35 | 42 |
| 139.1-279 | 21 | 28 | 35 | 42 | 50 |
| 279.1-418 | 28 | 35 | 42 | 50 | 57 |
| 418.1-557 | 35 | 42 | 50 | 57 | 64 |
| 557.1-697 | 42 | 50 | 57 | 64 | 71 |
| >697 | 50 | 57 | 64 | 71 | 78 |

B201.2 System Type. The whole-house ventilation system shall consist of one or more supply or exhaust fans and associated ducts and controls. Local exhaust fans shall be permitted to be part of a mechanical exhaust system. Outdoor air ducts connected to the return side of an air handler shall be permitted as supply ventilation if manufacturers' requirements for return air temperature are met. See ASHRAE 62.2*, Appendix B for guidance on selection of methods.

B201.3 Control and Operation. The "fan on" switch on a heating or air-conditioning system shall be permitted as an operational control for systems introducing ventilation air through a duct to the return side of an HVAC system. Readily accessible override control must be provided to the occupant. Local exhaust fan switches and "fan on" switches shall be permitted as override controls. Controls, including the "fan-on" switch of a conditioning system, must be appropriately labeled.

Exception: An intermittently operating, whole-house mechanical ventilation system may be used if the ventilation rate is adjusted according to the exemption to Section B201.4. The system must be designed so that it can operate automatically based on a timer. The intermittent mechanical ventilation system must operate at least one hour out of every twelve.

Equation B201.4

$$Q_f = Q_r / (\epsilon f)$$

where

Q_f = fan flow rate

Q_r = ventilation air requirement (from Table B201.1a or B201.1b)

ϵ = ventilation effectiveness (from Table B201.1)

f = fractional on time

if the system runs at least every three hours, 1.0 can be used as the ventilation effectiveness. (See ASHRAE 62.2*, Appendix B for an example of this calculation.)

TABLE B201.4
Ventilation Effectiveness for Intermittent Fans

| Daily Fractional On-Time, f | Ventilation Effectiveness, ϵ |
|-------------------------------|---------------------------------------|
| $f \leq 35\%$ | 0.33 |
| $35\% \leq f < 60\%$ | 0.50 |
| $60\% \leq f < 80\%$ | 0.75 |
| $80\% \leq f$ | 1.0 |