

SECTION 301—DEFINED TERMS AND ACRONYMS

301.1 Definitions.¹

ATTACHED DWELLING UNIT. A *dwelling unit* sharing demising walls, floors, ceilings or common corridors with another *dwelling unit* or *occupiable space*.

ATTIC. A space volume directly below the roof assembly that is not included in the *conditioned floor area*. Attics may be either vented or air sealed.²

BLOWER FAN. The fan inside the equipment of a *forced-air HVAC system* that forces the heated or cooled air to be distributed within a *dwelling*.

COMMERCIAL BUILDING. All buildings that are not included in the definition of *residential buildings*.

COMPARTMENTALIZATION BOUNDARY. The surface that bounds the *infiltration volume* of the *dwelling unit*.

CONDITIONED FLOOR AREA (CFA).³ The floor area of the *conditioned space volume* within a building or *dwelling unit*, not including the floor area of *attics* or crawl spaces, and basements below air-sealed and insulated floors. The following specific spaces are addressed to ensure consistent application of this definition:

1. The CFA shall include the floor area of the full width of a wall assembly that is within the *conditioned space volume*.
Exception: If the subject *dwelling unit* shares a wall assembly⁴ with another *dwelling unit*, then the CFA of the subject *dwelling unit* shall extend to the midpoint of that shared wall assembly.
2. The CFA shall include the floor area of a basement only if it is contiguous with and dedicated⁵ to the subject *dwelling unit* and the party conducting evaluations has either:
 - 2.1. Obtained an ACCA Manual J, S, and either B or D report and verified that both the heating and cooling equipment and distribution system are designed to offset the entire design load of the volume.
 - 2.2. Verified through visual inspection that both the heating and cooling equipment and distribution system serve the volume and, in the judgment of the party conducting evaluations, are capable of maintaining space conditions at 78°F (26°C) for cooling and 68°F (20°C) for heating.
3. The CFA shall exclude the floor area of a garage even when it is conditioned.
4. The CFA shall exclude the floor area of a thermally isolated sunroom.
5. The CFA shall exclude the floor area of an *attic*, even when it is *conditioned space volume*.⁶
6. The CFA shall exclude the floor area of a crawl space, even when it is *conditioned space volume*.

CONDITIONED SPACE VOLUME (CSV).⁷ The volume within a *dwelling unit* serviced by a space heating or cooling system designed to maintain space conditions at 78°F (26°C) for cooling and 68°F (20°C) for heating. The following specific spaces are addressed to ensure consistent application of this definition:

1. If the volume both above and below a floor assembly meets this definition and is part of the subject *dwelling unit*, then the CSV shall include the volume of the full depth of the floor assembly. Otherwise, the volume of the full depth of the floor assembly shall be excluded.
Exception: The wall height used to determine the volume shall extend from the finished floor to the bottom surface of the floor decking above the subject *dwelling unit* for all floors other than the top floor level. For *dwelling units* on the top floor, this dimension shall extend from the top surface of the finished floor to the interior surface of the enclosure air barrier.
2. If the volume of at least one of the spaces horizontally adjacent to a wall assembly meets this definition, and that volume is part of the subject *dwelling unit*, the CSV shall include the volume of the full width of the wall assembly. Otherwise, the volume of the full width of the wall assembly shall be excluded.
Exception: If the subject *dwelling unit* shares a wall assembly⁸ with another *dwelling unit*, then the CSV of the subject *dwelling unit* shall include half the volume of the full width of that shared wall assembly.
3. The CSV shall exclude the volume of a garage, even when it is conditioned.
4. The CSV shall exclude the volume of a thermally isolated sunroom.

1. (Informative Note) When used in this standard, italicization indicates that the term is defined in Section 301.1.

2. (Normative Note) *Conditioned space volume* that is intended for human activities (e.g., for living, sleeping, dining, or cooking; as well as toilets, closets, halls, utility areas, and laundry areas) and above the main *dwelling unit*, such as in a 'Cape Cod' home, is not considered *attic* space and can be included in the *conditioned floor area*.

3. (Informative Note) Informative Annex A contains a table that summarizes parts of a *dwelling unit* that are included in CFA.

4. (Informative Note) For example, a common or demising wall.

5. (Informative Note) That is, it does not span multiple *dwelling units* undivided.

6. (Informative Note) *Conditioned space volume* that is intended for human activities (e.g., for living, sleeping, dining, or cooking; as well as toilets, closets, halls, utility areas, and laundry areas) and above the main *dwelling unit*, such as in a 'Cape Cod' home, is not considered *attic* space and can be included in the *conditioned floor area*.

7. (Informative Note) Informative Annex A has a table that summarizes parts of a *dwelling unit* that are included in *conditioned space volume*.

8. (Informative Note) For example, a common or demising wall.

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5. The CSV shall include the volume of an *attic*, crawl space or basement only if it is contiguous with and dedicated⁹ to the subject *dwelling unit* and the party conducting evaluations has either:
 - 5.1 Obtained an ACCA Manual J, S, and either B or D report and verified that both the heating and cooling equipment and distribution system are designed to offset the entire design load of the volume.
 - 5.2 Verified through visual inspection that both the heating and cooling equipment and distribution system serve the volume and, in the judgment of the party conducting evaluations, are capable of maintaining space conditions at 78°F (26°C) for cooling and 68°F (20°C) for heating.
6. The CSV shall include the volume of an adjacent mechanical closet, regardless of access location, only if it is contiguous with and dedicated⁸ to the subject *dwelling unit*, includes equipment serving the subject *dwelling unit*, and the party conducting evaluations has either:
 - 6.1 Obtained an ACCA Manual J, S, and either B or D report and verified that both the heating and cooling equipment and distribution system are designed to offset the entire design load of the volume.
 - 6.2 Verified through visual inspection that both the heating and cooling equipment and distribution system serve the volume and, in the judgment of the party conducting evaluations, are capable of maintaining space conditions at 78°F (26°C) for cooling and 68°F (20°C) for heating.

DETACHED DWELLING UNIT. A *dwelling unit* that does not meet the definition of *attached dwelling unit*.

DWELLING. Any building that contains one or two *dwelling units* used, intended or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.

DWELLING UNIT MECHANICAL VENTILATION SYSTEM. A *ventilation* system, operating continuously or through a programmed intermittent schedule, consisting of powered *ventilation* equipment,¹⁰ related mechanical components and automated control devices¹¹ that provides *dwelling unit ventilation* at a known or measured airflow rate.

EXHAUST VENTILATION SYSTEM (EXHAUST SYSTEM). One or more fans that remove air from the *dwelling unit*, causing outdoor air to enter by *ventilation* inlets or normal leakage paths through the *dwelling unit* envelope.

FORCED-AIR HVAC SYSTEM. A type of *HVAC system* that incorporates a *blower fan* to move conditioned air.

HVAC SYSTEM. Cooling-only, heating-only or combined cooling-heating equipment, including any supply or return distribution systems.

INFILTRATION VOLUME.¹² The sum of the following spaces of the subject *dwelling unit*:

1. The *conditioned space volume*, excluding any *attics*, basements, crawl spaces and adjacent mechanical closets.
2. The *conditioned space volume* and *unconditioned space volume* of the following adjacent spaces if included¹³ during the airtightness measurement of the enclosure: *attics*, crawl spaces and the full depth of their floor assemblies above, basements and the full depth of their floor assemblies above, and adjacent mechanical closets and the full width of their wall assemblies between them and the subject *dwelling unit*.

OCCUPIABLE SPACE. A room or enclosed space designed for human occupancy in which individuals congregate for amusement, educational or similar purposes, or in which occupants are engaged at labor. Such space is equipped with means of egress and light and *ventilation* facilities meeting the requirements of this standard.

RESIDENTIAL BUILDING. Includes detached one-family *dwelling units* and two-family *dwelling units* and multiple single-family *dwelling units* (*townhouses*) and Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.¹⁴

SHALL. As used in this standard, the word “shall” means that the action specified is mandatory and shall be accomplished by the responsible party.

SLEEPING UNIT. A room or space in which people sleep, that may include permanent provisions for living, eating, and either sanitation or kitchen facilities but not both. Such rooms and spaces that are also part of a *dwelling unit* are not *sleeping units*.

TOWNHOUSE. A single-family *dwelling unit* constructed in a group of three or more attached units in which each unit extends from the foundation to roof and with open space on at least two sides.

9. (Informative Note) That is, it does not span multiple *dwelling units* undivided.

10. (Informative Note) Such as motor-driven fans and blowers.

11. (Informative Note) Such as ducts, inlets, dampers or filters.

12. (Informative Note) Informative Annex A has a table that summarizes parts of a *dwelling unit* that are included in an *infiltration volume*.

13. (Informative Note) Sections 402.4, 402.5, 402.6 and 402.7 define whether these adjacent spaces are to be included in the *infiltration volume*.

14. (Normative Note) The definition of “Residential building” corresponds to the *International Energy Conservation Code* definition of “Residential building.” The Occupancy Groups R-2, R-3 and R-4 are as established by the *International Building Code*.

UNCONDITIONED SPACE VOLUME.¹⁵ The volume within a *dwelling unit* that is not *conditioned space volume* but which contains heat sources or sinks that influence the temperature of the area or room. The following specific spaces are addressed to ensure consistent application of this definition for inclusion in unconditioned space volume:

1. If one or both of the volumes above and below a floor assembly is *unconditioned space volume*, then the volume of the full depth of the floor assembly shall be included.
2. If the volume of both of the spaces horizontally adjacent to a wall assembly are *unconditioned space volume*, then the volume of the full width of the wall assembly shall be included.

Exception: If the volume of one of the spaces horizontally adjacent to a wall assembly is a *dwelling unit* other than the subject *dwelling unit*, then the volume of the full width of that wall assembly shall be evenly divided between both adjacent *dwelling units*.

3. The volume of an attached garage shall be included, even when it is conditioned.
4. The volume of a thermally isolated sunroom shall be included.
5. The volume of an *attic*, *crawl space*, or *basement* shall be included unless it meets the definition of *conditioned space volume*.

VENTILATION. The process of supplying outdoor air to or removing indoor air from a *dwelling unit* by natural or mechanical means. Such air may or may not have been conditioned.

WHOLE-HOUSE FAN. A forced-air system consisting of a fan or blower that exhausts at least 5 air changes per hour (ACH) of indoor air to the outdoors, thereby drawing outdoor air into a home through open windows and doors for the purpose of cooling the home.

301.2 Acronyms. (Informational)

ACH	Air Changes per Hour
ACH50	Air Changes per Hour at 50 Pascals
ANSI	American National Standards Institute
ASTM	ASTM International, originally known as the American Society for Testing and Materials (ASTM)
CFA	Conditioned Floor Area
CFM	Cubic Feet per Minute
CSV	Conditioned Space Volume
DOE	US Department of Energy
DWHR	Drain Water Heat Recovery
EER	Energy Efficiency Ratio
EF	Energy Factor
ELA	Effective Leakage Area
HVAC	Heating, Ventilating and Air Conditioning
ICC	International Code Council
OSHA	Occupational Health and Safety Administration
Pa	Pascal
RESNET	Residential Energy Services Network, Inc.
SEER	Seasonal Energy Efficiency Ratio

15. (Informative Note) Informative Annex A has a table that summarizes parts of a *dwelling unit* that are included in an *unconditioned space volume*.

PROCEDURE FOR MEASURING AIRTIGHTNESS OF DWELLING UNIT ENCLOSURE

SECTION 401—TEST EQUIPMENT

401.1 Equipment. The equipment listed in this section shall have its calibrations checked at the manufacturer's recommended interval and at least annually if no time is specified.

1. **AIR MOVING FAN.** A fan that is capable of moving air into or out of the *dwelling unit* to achieve one or more target pressure differences between the *dwelling unit* and the exterior.
2. **MANOMETER.** A device that is capable of measuring pressure difference with a maximum error of 1 percent of the reading or 0.25 Pa (0.001 in. H₂O), whichever is greater.
3. **AIRFLOW METER.** A device to measure volumetric airflow with a maximum error of 5 percent of the measured flow.
4. **THERMOMETER.** An instrument to measure air temperature with an accuracy of $\pm 2^{\circ}\text{F}$ ($\pm 1^{\circ}\text{C}$).
5. **BLOWER DOOR.** A device that combines an *air-moving fan* as defined in Item 1, an *airflow meter* as defined in Item 3 and a covering to integrate the *air-moving fan* into the *dwelling unit* opening.

SECTION 402—PROCEDURE TO PREPARE THE DWELLING UNIT FOR TESTING

402.1 Fenestration. Exterior doors and windows shall be closed and latched.

402.2 Pet doors. Exterior pet doors shall be closed and latched to the extent that a specific closing or latching mechanism exists. No additional sealing shall be performed.

402.3 Attached garages. All exterior garage doors and windows shall be closed and latched unless the *blower door* is installed between the *conditioned space volume* and the garage, in which case an unrestricted air pathway larger than 20 square feet (1.86 m²) shall be opened between the attached garage and the outdoors.¹

402.4 Attics. An *attic* shall be configured as follows, and excluded from the *infiltration volume*, unless it meets the conditions in Section 402.4.1. Any doors and hatches between the subject *dwelling unit* and the *attic* shall be closed and any exterior *attic* access doors, hatches and vents shall be left in the as-found position.

402.4.1 If an *attic* is contiguous with and dedicated² to the subject *dwelling unit* and is either: (1) *conditioned space volume*, or (2) *unconditioned space volume* that is unvented with a roof deck and all exterior walls both insulated and air-sealed; then any exterior *attic* access doors, hatches, and vents shall be closed to the extent possible. The pressure difference between the *attic* and subject *dwelling unit* shall be evaluated during the airtightness test, in accordance with Section 404.1.3 (one-point airtightness test) or 404.2.3 (multiple-point airtightness test), to determine whether to include the *attic* in the *infiltration volume*.

402.5 Crawl spaces. A crawl space shall be configured as follows, and the crawl space and full depth of its floor assembly above excluded from the *infiltration volume*, unless it meets the conditions in Section 402.5.1. Any doors and hatches between the subject *dwelling unit* and the crawl space shall be closed and any exterior crawl space access doors, hatches and vents shall be left in their as-found position.

402.5.1 If a crawl space is contiguous with and dedicated³ to the subject *dwelling unit* and is either: (1) *conditioned space volume*, or (2) *unconditioned space volume* that is unvented with all exterior walls both insulated and air-sealed; then any exterior crawl space access doors, hatches and vents shall be closed to the extent possible. The pressure difference between the crawl space and subject *dwelling unit* shall be evaluated during the airtightness test, in accordance with Section 404.1.3 (one-point airtightness test) or 404.2.3 (multiple-point airtightness test), to determine whether to include the crawl space and full depth of its floor assembly above in the *infiltration volume*.

402.6 Basements. A basement shall be configured as follows, and the basement and full depth of its floor assembly above excluded from the *infiltration volume*, unless it meets the conditions in Section 402.6.1 or 402.6.2. Any doors and hatches between the subject *dwelling unit* and the basement shall be closed and any exterior basement access doors, hatches and vents shall be left in the as-found position.

402.6.1 If a basement is contiguous with and dedicated⁴ to the subject *dwelling unit* and is either: (1) *conditioned space volume*, or (2) *unconditioned space volume* that is unvented with all exterior walls both insulated and air-sealed; then any exterior basement access doors, hatches and vents shall be closed to the extent possible. The pressure difference between the basement and subject *dwelling unit* shall be evaluated during the airtightness test, in accordance with Section 404.1.3 (one-point airtightness test) or 404.2.3 (multiple-point airtightness test), to determine whether to include the basement and full depth of its floor assembly above in the *infiltration volume*.

1. (Informative Note) For example, by opening a window or door between the attached garage and the outdoors.
 2. (Informative Note) That is, it does not span multiple *dwelling units* undivided.
 3. (Informative Note) That is, it does not span multiple *dwelling units* undivided.
 4. (Informative Note) That is, it does not span multiple *dwelling units* undivided.

402.6.2 If a basement is contiguous with and dedicated⁵ to the subject *dwelling unit* and is *unconditioned space volume* that is unvented with no insulation present in either its exterior walls or floor assembly above, then the basement and full depth of its floor assembly above are permitted to be either included or excluded from the *infiltration volume*, dependent on its configuration during the airtightness test. If it is to be excluded, then it shall be configured according to Section 402.6. If it is to be included, then any exterior basement access doors, hatches and vents shall be closed to the extent possible. The pressure difference between the basement and subject *dwelling unit* shall be evaluated during the airtightness test, in accordance with Section 404.1.3 (one-point airtightness test) or 404.2.3 (multiple-point airtightness test), to determine whether to include the basement and full depth of its floor assembly above in the *infiltration volume*.

402.7 Adjacent mechanical closets. An adjacent mechanical closet shall be configured as follows, and the mechanical closet and full width of the wall assembly between it and the subject *dwelling unit* excluded from the *infiltration volume*, unless it meets the conditions in Section 402.7.1. Any doors and hatches between the subject *dwelling unit* and the mechanical closet shall be closed and any exterior mechanical closet access doors, hatches and vents shall be left in the as-found position.

402.7.1 If an adjacent mechanical closet is contiguous with and dedicated⁶ to the subject *dwelling unit*, only includes equipment serving the *dwelling unit*, and is either: (1) *conditioned space volume*, or (2) *unconditioned space volume* that is unvented with the wall assembly between it and the subject *dwelling unit* not air-sealed; then any exterior mechanical closet access doors, hatches and vents shall be closed to the extent possible. The pressure difference between the mechanical closet and subject *dwelling unit* shall be evaluated during the airtightness test, in accordance with Section 404.1.3 (one-point airtightness test) or 404.2.3 (multiple-point airtightness test), to determine whether to include the mechanical closet and full width of the wall assembly between it and the subject *dwelling unit* in the infiltration volume.

402.8 Interior doors. All doors between rooms inside the *conditioned space volume* shall be opened.

402.9 Chimney dampers and combustion-air inlets on solid fuel appliances. Chimney dampers and combustion-air inlets on solid fuel appliances shall be closed. Precautions shall be taken to prevent ashes or soot from entering the *dwelling unit* during testing.

402.10 Combustion appliance flue vents. Combustion appliance flue vents shall be left in the as-found position.

402.11 Fans. Any fan or appliance capable of inducing airflow across the *dwelling unit* enclosure shall be turned off including, but not limited to, clothes dryers, *attic* and crawl space fans, kitchen and bathroom exhaust fans, air handlers, and *ventilation* fans used in a *dwelling unit mechanical ventilation system*.⁷ The party conducting the test shall not turn on fans in adjacent *attached dwelling units*. For continuously operating central *ventilation* systems serving more than one *dwelling unit* in a building with multiple *dwelling units*, the registers shall be sealed in the subject *dwelling unit*. The central *ventilation* system shall be turned off where possible. If it is not possible to turn off the system, it may continue operating provided that sealing select registers will not compromise the system and the sealed registers remain sealed during the test.

402.12 Dampers. Nonmotorized dampers⁸ shall be left in their as-found positions.⁹ Motorized dampers shall be placed in their closed positions.

402.13 Openings for ventilation air.

402.13.1 Each continuously operating local mechanical exhaust system¹⁰ and continuously operating *dwelling unit mechanical ventilation system* shall be sealed¹¹ for the duration of the test at the inlet terminal for that fan¹² at a location within the *ventilation* or exhaust duct, at the *ventilation* or exhaust equipment itself or at the outlet terminal for that fan, whichever is accessible. The sealing location selected shall be documented.

402.13.2 All intermittently operating local mechanical exhaust systems and intermittently operating *dwelling unit mechanical ventilation systems* shall not be sealed, including such systems that control the HVAC fan.

402.13.3 If a continuously operating *exhaust ventilation system* is present in the *dwelling unit*, all operable window trickle vents, operable through-the-wall vents, outdoor air intakes with an operable shutoff damper¹³ and other operable *ventilation* air openings shall be placed in the closed position for the duration of the test but shall not be sealed.

402.13.4 *Ventilation* air openings besides those listed in Section 402.13.3 shall be left in the as-found position and shall not be sealed.

402.14 Openings for combustion air and makeup air. Combustion air openings and makeup air openings shall be left in the as-found position and shall not be sealed.

402.15 Whole-house fan louvers/shutters. *Whole-house fan* louvers and shutters shall be closed. If there is a seasonal sealing cover present, it shall be installed.

5. (Informative Note) That is, it does not span multiple *dwelling units* undivided.

6. (Informative Note) That is, it does not span multiple *dwelling units* undivided.

7. (Informative Note) For example, a system intended to meet ASHRAE 62.2.

8. (Informative Note) For example, pressure-activated (i.e., barometric) dampers, fixed dampers or balancing dampers.

9. (Informative Note) For example, a fixed damper in a duct supplying outdoor air for an intermittent *dwelling unit mechanical ventilation system* that utilizes the HVAC fan shall be left in its as-found position.

10. (Informative Note) Examples of local exhaust ventilation systems are bath and kitchen fans.

11. (Normative Note) A motorized damper placed in its closed position or a nonmotorized damper pushed into its closed position during the test shall satisfy the intent of this section to seal the opening if it is located at one of the listed sealing locations. In such cases, additional sealing is permitted but not required.

12. (Informative Note) See Figure 601.1 in Chapter 6 for an illustration of the inlet terminal, ventilation duct and outlet terminal. Example of potential sealing locations: An inline fan connected to the return side of the *HVAC system* may be sealed at the exterior of the *dwelling unit*, at the filter slot of the inline fan, or where the *ventilation* duct terminates in the return duct of the *HVAC system*, whichever is accessible.

13. (Informative Note) For example, a manual shutoff damper in a duct supplying outdoor air to the return side of the *HVAC system* shall be closed if a continuously operating local mechanical exhaust system or continuously operating *exhaust ventilation system* is present.