ADDENDA

ANSI/ASHRAE/IES Addendum h to ANSI/ASHRAE/IES Standard 90.2-2018

Energy Efficient Design of Low-Rise Residential Buildings

Approved by the ASHRAE Standards Committee on January 20, 2024; by the Illuminating Engineering Society on December 21, 2023; and by the American National Standards Institute on February 21, 2024.

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FOREWORD

Addendum h updates the air leakage maximum values and testing protocols to better align Standard 90.2 with other relevant codes and standards, including ASHRAE Standard 62.2 and the first public draft of the 2024 IECC. More specifically this addendum makes the following changes to the standard:

- Reduces the maximum air leakage (increases stringency) to be consistent with the updated requirements in ASHRAE Standard 62.2-2022
- Updates the air leakage testing protocol to allow for testing as a whole building or as multiple dwelling units in multifamily buildings to provide better coordination with the IECC
- *Informative Note:* In this addendum, changes to the current standard are indicated in the text by <u>underlining</u> (for additions) and strikethrough (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum h to Standard 90.2-2018

Modify Section 3.1 as shown.

attached dwelling unit: a dwelling unit sharing demising walls, floors, ceilings or common corridors with another dwelling unit or occupiable space.

dwelling-unit enclosure area: the sum of the area of ceiling, floors, and walls separating a *dwelling unit's conditioned space* from the exterior or from adjacent conditioned or unconditioned spaces. Wall height shall be measured from the finished floor of the *dwelling unit* to the underside of the floor or building element bounding an unconditioned space above.

Modify Section 3.2 as shown.

<u>cfm₅₀</u> <u>cubic feet per minute measured at a pressure difference of 0.2 in. of water (50 Pa)</u>

Modify Section 6.3.2 as shown.

6.3.2 Maximum Envelope Air Leakage. The *building* or *dwelling unit* shall have a tested air leakage rate no greater than 5 ACH₅₀ in Climate Zones 0 through 2 and no greater than 3 ACH₅₀ in Climate Zones 3 through 8.

Modify Section 7.1.2 as shown.

7.1.2 Building <u>Thermal</u> Envelope Air leakage. The *building thermal envelope* shall have a tested air leakage rate not-exceeding greater than either -5.3.0 ACH₅₀ or $0.15 \text{ cfm}_{50}/\text{ft}^2 (0.75 \text{ L/s} \cdot \text{m}^2)$ of *dwelling unit enclosure area* or *building thermal envelope area*, as appropriate, at a pressure differential of 0.2 in. of water (50 Pa).

Modify Section 8.2.4 as shown.

8.2.4 Building <u>Thermal</u> Envelope Airtightness Verification

8.2.4.1 Building airtightness testing to confirm that built airtightness is in accordance with the proposed design shall be performed on all residential dwellings in accordance with Normative Appendix C.

8.2.4.2 Testing shall be performed by entities approved by the AHJ.

8.2.4.3 Report of testing shall be provided to the *AHJ*.

8.2.4.4 Testing shall be permitted to be conducted at any point after the building has been enclosed.

Modify Normative Appendix C as shown.

C1.3 Single-Zone Single-Dwelling-Unit Buildings. Single-zone buildings Buildings comprising a single <u>dwelling unit</u> shall be tested with a single fan pressurization test and represent the leakage rate for the entire structure. Where the tested leakage rate exceeds 115% of the design target, diagnostics shall be performed to identify corrective air-leakage sealing measures necessary to achieve compliance. These corrective measures shall be applied and the building retested for compliance.

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C1.4 Multizone Attached-Dwelling-Unit Buildings. Multizone buildings Buildings comprising two or more attached dwelling units or common areas shall be permitted to be tested either as an individual zone or by inducing equal pressures in adjacent zones. a whole building or as dwelling units in accordance with Section C1.4.1. Multizone buildings shall have a random sample of a minimum 20% of all zones tested, including a minimum of two zones, and at least one of the zones shall have at least three exterior sides. The average leakage rate of all zones tested shall determine compliance, provided that none of the zones have an ACH50 greater than 115% of the design target ACH50. Where the average leakage rate of all tested zones exceeds the design target ACH50, or where any one of the tested zones to identify corrective air-leakage sealing measures necessary to achieve compliance. These corrective measures shall be applied to all found compliant. A new random sample of previously nontested zones shall be selected for testing to verify compliance.

C1.4.1 Dwelling-Unit Testing. Where multiple *dwelling units* or other spaces are contained within one *building thermal envelope*, each unit shall be considered an individual testing unit, and the building air leakage rate shall be the weighted average of all tested unit results, weighted by each tested unit's enclosure area as follows:

- a. Where buildings have fewer than eight total dwelling or sleeping testing units, each unit shall be tested.
- b. Where buildings have eight or more dwelling or sleeping testing units, the greater of seven units or 20% of the testing units in the building shall be tested, including a top-floor unit, a middle-floor unit, a ground-floor unit, and a unit with the largest dwelling units enclosure area. For each tested unit that exceeds 115% of the target air leakage rate, an additional three units shall be tested, comprising a mixture of testing-unit types and locations within the building.
- c. Common areas with not less than one exterior wall in the building thermal envelope shall be tested and included in the weighted average.

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Exception to (c): Corridors, stairwells, and enclosed spaces having a conditioned floor area not greater than 1500 ft<sup>2</sup> (139 m<sup>2</sup>).
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Where any of the tested units exceeds 115% of the design target leakage rate, diagnostics shall be performed on the noncompliant units to identify corrective air-leakage sealing measures necessary to achieve compliance. A new sampling of untested units shall be tested in accordance with Section C1.4.1(b).

C1.5 Test Protocol

C1.5.1 Air leakage tests shall be conducted under the following conditions:

- a. Ventilation fans and exhaust fans are turned off.
- b. Combustion equipment using conditioned air shall be disabled or put in pilot position.
- c. Prior to testing, all doors, fireplaces, windows and operable windows shall bed closed but not sealed.
- d. Prior to testing, all intentional openings (dryer ducts, bath fans, fresh air *ventilation* systems, plumbing traps, fill with water) shall be sealed. Plumbing traps shall be filled with water.
- e. Prior to testing, all interior doors shall be opened.
- f. Heating and cooling supply and return ducts shall not be sealed.

C1.5.2 Air leakage results shall be reported as ACH_{50} or as cfm_{50}/ft^2 (1.0 L/s·m²) of *dwelling-unit* enclosure area or building thermal envelope area, as appropriate, at a pressure differential of 0.2 in. of water (50 Pa). The conditioned volume (CV) of the building or building portion shall be calculated by taking the conditioned floor area per ANSI Z765 or BOMA Z65.4 and multiplying by the average ceiling height. If the ceiling is not finished, the height of the lower portion of the floor joist/rafter shall be used to determine average ceiling height. ACH₅₀ shall be calculated using the following equation:

 $ACH_{50} = 60 \times cfm_{50}/CV (ft^3)$

<u>ACH₅₀ = $(3600 \times L/s)/CV(L)$ </u>

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ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

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