

2024 IECC

NBI has submitted proposals into the ICC process to advance the 2024 IECC. The proposed amendments cover a wide range of measures and improve the code by adding additional efficiency, clarifying requirements, and creating greater flexibility for code users and local jurisdictions. Learn more at newbuildings.org/code_policy/2024-iecc-national-model-energy-code-base-codes.

Code Change Title: Air Barrier Testing CEPI-58-21

Summary: Increase building size threshold for testing to 250,000 ft² and reduce allowable air leakage rate to 0.25 cfm/ft².

Revise text as follows:

C402.5 Air leakage—thermal envelope. The *building thermal envelope* shall comply with Sections C402.5.1 through Section C402.5.11.1, ~~or the building thermal envelope shall be tested in accordance with Section C402.5.2 or C402.5.3. Where compliance is based on such testing, the building shall also comply with Sections C402.5.7, C402.5.8 and C402.5.9.~~

Revise text as follows:

C402.5.1.2 Air barrier compliance. A continuous air barrier for the opaque building envelope shall ~~comply with the following:~~ meet the provisions of Section 402.5.3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5

1. Buildings or portions of buildings, including Group R and I occupancies, shall meet the provisions of Section C402.5.2.

Exception: Buildings in Climate Zones 2B, 3C and 5C.

Group R and Group I occupancies that meet the provisions of Section C402.5.2. Portions of buildings containing Group R or Group I occupancies that are not tested shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5. Buildings or portions of buildings other than Group R and I occupancies shall meet the provisions of Section C402.5.2.

Exceptions:

1. Buildings in Climate Zones 2B, 3B, 3C and 5C.
2. Buildings larger than 5,000 square feet (464.5 m²) floor area in Climate Zones 0B, 1, 2A, 4B and 4C.
3. Buildings between 5,000 square feet (464.5 m²) and 50,000 square feet (4645 m²) floor area in Climate Zones 0A, 3A and 5B.
3. Buildings or portions of buildings that do not complete air barrier testing shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5

Revise text as follows:

C402.5.2 Dwelling and sleeping unit enclosure testing. The *building thermal envelope* shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the *code official*. The measured air leakage shall not exceed ~~0.30 cfm/ft² (1.5 L/s m²)~~ 0.20 cfm/ft² (1.0 L/s m²) of the dwelling or sleeping unit testing unit enclosure area at a pressure differential of 0.2-inch water gauge (50 Pa). Where

multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one building thermal envelope, ~~each unit shall be considered an individual testing unit, and~~ the building air leakage shall be the weighted average of all testing unit results, area weighted by the enclosure area of each testing tested unit's enclosure area. Units shall be tested without simultaneously testing adjacent units and shall be separately with an unguarded blower door tested as follows:

1. Where buildings have fewer than eight total dwelling or sleeping units testing units, each testing unit shall be tested.
2. For buildings with eight or more dwelling or sleeping units testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional two units shall be tested, including a mixture of testing unit types and locations.

Revise text as follows:

C402.5.3 Whole-Building thermal envelope testing. The building thermal envelope shall be tested in accordance with ASTM E779, ~~ANSI/RESNET/ICC 380~~, ASTM E3158 or ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed ~~0.40 cfm/ft² (2.0 L/s × m²)~~ 0.25 cfm/ft² (1.25 L/s m²) of the building thermal envelope area at a pressure differential of 0.3 inch water gauge (75 Pa).

Exceptions:

~~Alternatively,~~ 1. For buildings larger than 50,000 ft² (4,645 m²), portions of the building shall be tested and the measured air leakages shall be area weighted by the surface areas of the building envelope in each portion. The weighted average test results shall not exceed the whole building leakage limit. ~~In the alternative approach,~~ ‡The following portions of the building shall be tested:-

1. The entire envelope area of all stories that have any spaces directly under a roof.
3. The entire envelope area of all stories that have a building entrance, exposed floor, or loading dock, or are below grade. Representative above-grade sections of the building totaling at least 25 percent of the wall area enclosing the remaining conditioned space.
4. Portions of buildings containing Group R or Group I occupancies that are not tested shall meet the provisions of Section C402.5.1.3 or C402.5.1.4 in addition to Section C402.5.1.5.

Exception: ~~Where the measured air leakage rate exceeds 0.40 cfm/ft² (2.0 L/s × m²) but does not exceed 0.60 cfm/ft² (3.0 L/s × m²), a diagnostic evaluation using smoke tracer or infrared imaging shall be conducted while the building is pressurized along with a visual inspection of the air barrier. Any leaks noted shall be sealed where such sealing can be made without destruction of existing building components. An additional report identifying the corrective actions taken to seal leaks shall be submitted to the code official and the building owner, and shall be deemed to comply with the requirements of this section.~~

2. For buildings larger than 250,000 ft² (25,000 m²), that do not include Group R or Group I occupancies, where an approved agency verifies the design and installation of the continuous air barrier in accordance with Section C402.5.1.5.

Revise text as follows:

C406.9 Reduced air infiltration. Air infiltration shall be verified by whole-building pressurization testing conducted in accordance with ASTM E779 or ASTM E1827 by an independent third party. The measured air-leakage rate of the building envelope shall not exceed ~~0.25 cfm/ft² (2.0 L/s × m²)~~ 0.17 cfm/ft² (0.85 L/s × m²) under a pressure differential of 0.3 inches water column (75 Pa), with the calculated surface area being the sum of the above and below-grade building envelope. A report that includes the tested surface area, floor area, air by volume, stories above grade, and leakage rates shall be submitted to the code official and the building owner.

Exceptions:

1. For buildings having over 250,000 square feet (25,000 m²) of conditioned floor area, ~~air leakage testing need not be conducted on the whole building where testing is~~ shall be conducted on representative above-grade sections of the building. Tested areas shall total not less than 25 percent of the conditioned floor area and shall be tested in accordance with this section.
2. For buildings or portions of buildings containing Group R or Group I occupancies, where testing is conducted in accordance with C402.5.2 and the weighted average of all testing unit results does not exceed 0.13 cfm/ft² (0.65 L/s m²) under a pressure differential of 0.2 inches water column (50 Pa).

Air leakage can be a significant source of energy waste in buildings, contributing to higher heating and cooling costs for building owners and occupants, and increasing risk related to comfort and durability. Air tightness testing can result in more attention to envelope assembly air barrier sealing and significantly reduced building leakage. Adequate control over air leakage can provide many benefits, including reduced HVAC equipment sizing, better building pressurization, and energy savings due to reduced heating and cooling of infiltrated outside air.