



ACH 50 testing or "blower door test"

(Revision to issue 2021-2018-10)

This edition of the Code Outreach Program addresses the mandatory air leakage testing requirements.

Air leakage testing, commonly referred to as "blower door testing," is mandatory for new low-rise buildings meeting the definition of a "residential building" in Chapter 2 of the 2020 Energy Conservation Construction Code of New York State (2020 ECCCNY), including low-rise residential "factory manufactured buildings."¹ In addition to the requirements of the 2020 ECCCNY, Section 401.2 of the 2020 Mechanical Code of New York State (2020 MCNY) provides that "all dwelling units,² where natural ventilation is proposed, shall be tested in accordance with Section R402.4.1.2 of the Energy Conservation Construction Code of New York State." Therefore, the requirement for air leakage testing applies to all new buildings that contain *dwelling units*, where natural ventilation is proposed, regardless of whether they are classified as *commercial buildings* or *residential buildings* in the 2020 ECCCNY.

Air leakage testing is also required in "spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy" or "any space that is converted to a dwelling unit or portion thereof from another use or occupancy" (see Sections R505.1 and R505.2). However, air leakage testing is not required when the scope of work performed in existing buildings is limited to *repairs, additions, and alterations*; nor is it required for "manufactured homes"³ constructed in compliance with the Department of Housing and Urban Development's "Manufactured Home Construction and Safety Standards" (24 CFR Part 3280).

According to Section R402.4 of the 2020 ECCCNY, the *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of Sections R402.4.1 through R402.4.5. The term "*building thermal envelope*" is defined in Chapter 2 of the 2020 ECCCNY as "the exterior walls (above and below grade), floors, ceiling, roofs and any other building element assemblies that enclose conditioned space or provide a boundary between conditioned space and unconditioned space."

Section R402.4.1.2 of the 2020 ECCCNY provides that "the building or dwelling unit shall be tested and verified as having an air leakage rate **not exceeding three air changes per hour**. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of **0.2 inch w.g. (50 Pascals)**" [emphasis added].

Section R402.4.1.3 of the 2020 ECCCNY provides an optional testing procedure, as an alternative to compliance with Section R402.4.1.2, where two or more *dwelling units* are located within one *building thermal envelope*. According to this procedure, the air leakage rate for each "testing unit" shall not exceed "**0.3 cubic feet per minute per square foot of enclosure surface area**," testing "shall be conducted with a blower door at a pressure of **0.2 inches w.g. (50 Pascals)**, and shall be conducted in accordance with ASTM E779" [emphasis added]. When this alternative testing procedure is chosen for a building with more than seven *dwelling units*, a representative sampling of the testing units could be allowed when approved by the *building official* (see Section R402.4.1.3.1). In all cases, testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

Who can perform this testing?

The entity performing air leakage testing should possess adequate training and expertise in the applicable reference standard and testing method. Section R402.4.1.2 of the 2020 ECCCNY indicates that the *building official* may require the testing to be conducted by an approved third party. Before approving a third-party tester, the *building official* should review their qualifications and determine that they are competent to perform the test.

What is required to document the test results?

According to Section R402.4.1.2 of the 2020 ECCCNY, "a written report of the results of the test shall be prepared and signed by the party conducting the test." The items required to be included in the report are listed in Section R402.4.1.2 or Section R402.4.1.3. The results of the building envelope air leakage testing (as documented in the written report), shall be included in the mandatory posted certificate in accordance with Section R401.3 of the 2020 ECCCNY.

¹ The definition of the term "factory manufactured buildings (modular buildings)" is found in Chapter 2 of the 2020 Residential Code of New York State (2020 RCNY).

² The term "dwelling unit" is defined in Chapter 2 of the 2020 ECCCNY and the 2020 MCNY.

³ The definition of the term "manufactured home" is found in Chapter 2 of the 2020 RCNY.