

Measured Air Leakage Requirements in Context

By Daniel Overbey

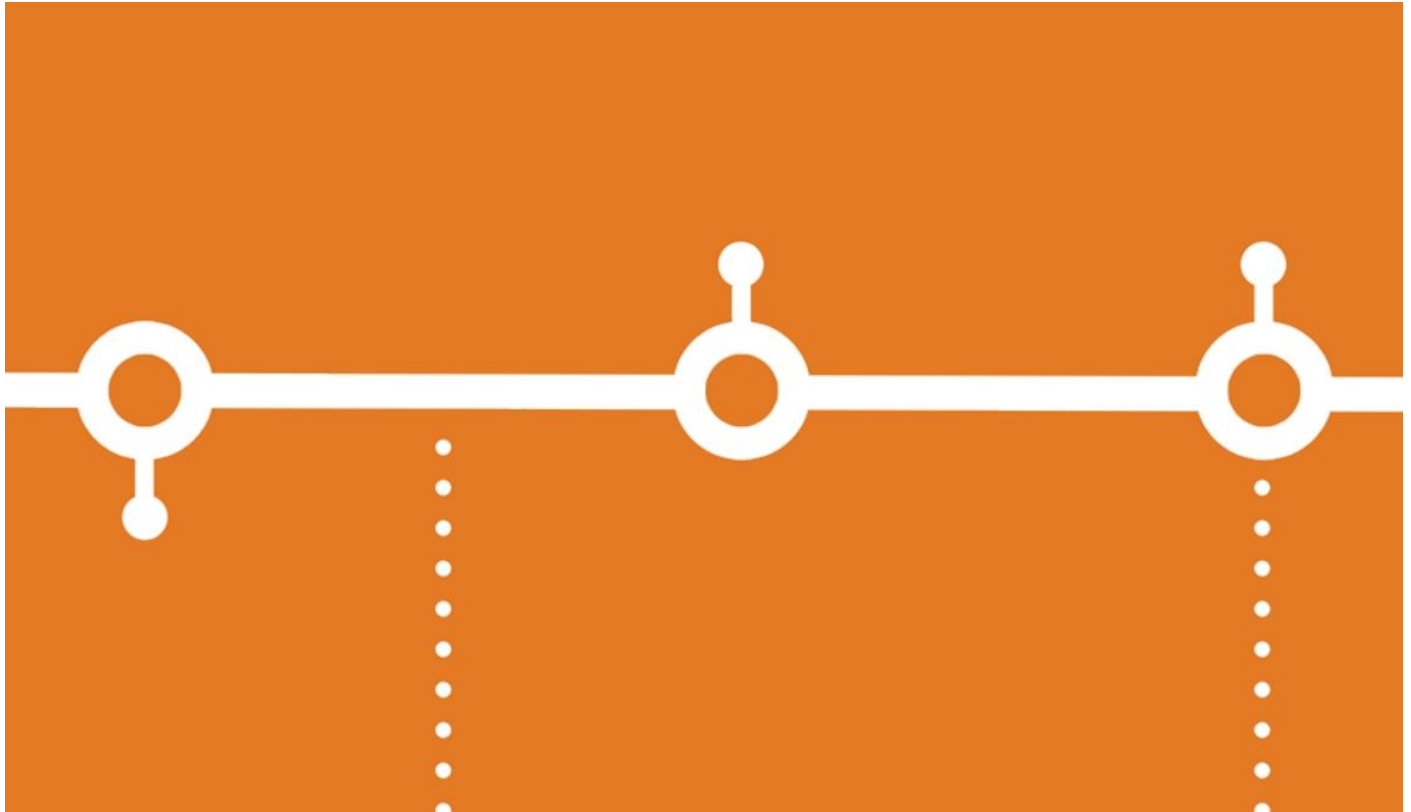


Image courtesy of author.

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Whole-building pressurization testing is becoming standard practice for building projects. Many common energy conservation standards and model codes now exhibit requirements for enclosure airtightness, which are to be achieved through measured air leakage rates.

However, the requirements vary considerably. Below is a brief summary of where measured air leakage rates stand today. All of the rates have been normalized to average cubic feet per minute (CFM) per square foot (ft²) under a pressure differential of 0.3 inch water gauge (75 Pascals or Pa).

Note: These measured air leakage requirements will change over time. Please note all information below is accurate as of this column's date of filing.

~1.00 CFM/ft² = Poor Performing Building

As a point of reference, consider a measured building enclosure air leakage rate around 1.00 CFM/ft² at 75 Pa to be a relatively poor-performing enclosure regarding airtightness. Some standards may cite 1.0 CFM₇₅/ft² as a baseline condition.

~0.60 CFM/ft² = Leaky Building

A typical leaky building could be expected to exhibit a measured building enclosure air leakage rate around 0.60 CFM/ft² at 75 Pa. You may consider this rate to be at or below standard practice.

0.40 CFM/ft² = Standard Practice

By the latest editions of energy conservation standards and model codes, this may be considered standard practice today.

ANSI/ASHRAE/IES Standard 90.1-2019 calls for whole-building pressurization testing in accordance with ASTM E779 or ASTM E1827. The mandatory provision of the standard requires the measured air leakage rate of the building envelope shall not exceed **0.40 CFM₇₅/ft²**.

2021 International Energy Conservation Code (IECC) requires building thermal envelope testing in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E3158, or ASTM E1827 such that the measured air leakage shall not exceed **0.40 CFM₇₅/ft²**.

0.25 CFM/ft² = Excellent Airtightness

The 2021 International Green Construction Code (IgCC) requires whole-building pressurization testing in accordance with ASTM E779, ASTM E1827, CAN/CGSB-149.10, CAN/GCSB-149.15, ISO 9972, or equivalent. The IgCC specifies that the measured air leakage rate of the building envelope shall not exceed **0.25 CFM₇₅/ft²**.

The US General Services Administration (GSA) P100 Facilities Standards for the Public Buildings Service (2021) references the 2018 IgCC to set a “baseline” level for enclosure airtightness of **0.25 CFM₇₅/ft²**.

The U.S. Army Corps of Engineers (USACE) [Air Leakage Test Protocol for Building Envelopes \(version 3, 2012\)](#) specifies a maximum building envelope air leakage rate of **0.25 CFM₇₅/ft²**.

≤0.11 CFM/ft² = Highest Standard in Airtightness

Any project with a measured air leakage rate at/under 0.11 CFM₇₅/FT² would be considered an extraordinarily airtight building.

The Passive House U.S. (PHIUS+) [2018 Passive Building Standard](#) requires **0.08 CFM/FT² at 75 Pa** (or 0.06 CFM/FT² at 50 Pa) for all buildings except those that are non-combustible (i.e., no wood-based framing members or sheet goods, and no wood-based or paper-based insulation, per the guidebook) and over five stories, which are permitted a maximum air leakage rate of **0.11 CFM/FT² at 75 Pa** (or 0.08 CFM/FT² at 50 Pa).

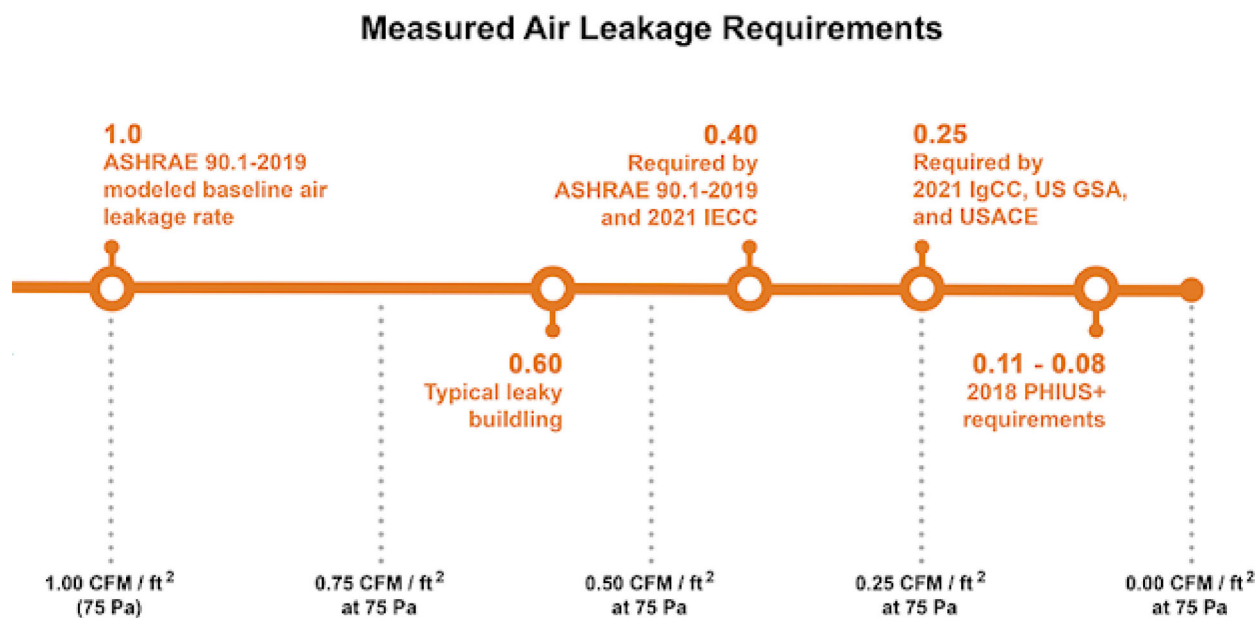
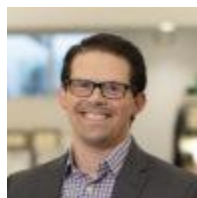


Figure: Measured air leakage requirements. Image courtesy of author.

KEYWORDS: [air leakage](#) [airtight buildings](#) [Building Enclosure](#) [Passive Houses](#)

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