



# Residential Air Leakage (Blower Door) Testing for Florida Code Compliance

## FACT SHEET



Infiltration or uncontrolled air leakage into buildings is a result of the number and size of cracks and gaps in the building's thermal envelope (its floor, walls, ceilings, windows, and doors) and the natural and mechanical air pressure "driving forces" that the building experiences.

The 6<sup>th</sup> Edition (2017) Florida Building Code air leakage testing requirements are specified in Section R402.4.1.2 of the residential Energy Conservation volume. This code section stipulates maximum leakage rates, how the test is to be conducted, who can conduct the testing, reporting requirements, and

at what point in construction the test can be performed.

The maximum air leakage rate allowed in Florida (Climate Zones 1 and 2) is up to 7 air changes per hour at a pressure of 0.2 inch w.g., or 50 pascals (also written as "7 ACH50").

Per the Florida Statutes referenced in Section R402.4.1.2, individuals qualified to provide air leakage testing include energy auditors, energy raters, Class A or B air-conditioning contractors and mechanical contractors, plus approved third parties. For the purposes of this code section, an approved third party is an individual approved by a code official to perform air leakage testing not affiliated with the building design or construction.

Air leakage tests are performed using a blower door, which includes the following components:

- Digital gauge
- Calibrated variable speed fan
- Adjustable frame and curtain
- Fan speed controller with cable
- Tubing

A blower door test can be performed at any time, but for Florida Code compliance, it is conducted just before the Certificate of Occupancy (CO) is issued, after all piping, wiring and other penetrations of the building thermal envelope have been installed.

Either a single- or multi-point blower door test can be conducted. A single point test only measures leakage at one house pressure (house With Reference To outside) of approximately 50 Pascals, while a multi-point test measures leakage over a range of house pressures (from approximately 15 Pascals to 55 Pascals).

The tester conducts the blower door test and records the house pressure, fan ring used for the test and fan pressure. Entering required data in software provides the corrected fan airflow rate in cubic feet per minute (CFM50).

**WARNING!**  
Due to the potential for combustion and other health and safety issues, blower door testing should only be conducted by trained, qualified individuals.



# Summary of Comments on BLDG-75-DRAFT\_Fact\_Sheet Stewart Comments.pdf

Page: 1

Number: 1 Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:05:10 PM

use definition found in code FSEC response (comments 1 and 2): We will change to actual code definition for the final version.

Author: AZ Stewart Subject: Sticky Note Date: 7/22/2018 2:42:09 PM

Number: 2 Author: AZ Stewart Subject: Cross-Out Date: 7/25/2018 12:06:00 PM

Number: 3 Author: AZ Stewart Subject: Cross-Out Date: 7/22/2018 2:16:25 PM FSEC response: We will remove "just" for the final version.

Number: 4 Author: AZ Stewart Subject: Sticky Note Date: 7/22/2018 2:16:18 PM

Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:06:22 PM

Strike the word Just because the code allows any time when the penetrations are sealed. No need to artificially restrict time FSEC response:

We will remove "just" for the final version.

Number: 5 Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:07:44 PM

Given the brevity of this fact sheet, including 'WRToutside' may be too much detail for a novice to process as inserted here. FSEC response: We do not

disagree with the point, but removing it and just leaving "house pressure" is not clear either, so suggest leaving as-is.

Number: 6 Author: AZ Stewart Subject: Highlight Date: 7/22/2018 2:19:32 PM

Number: 7 Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:09:24 PM

Can this be more explicit of no greater than? I think people get confused by 'up to' FSEC response: We will change to "no greater than" in the final version.

Number: 8 Author: AZ Stewart Subject: Cross-Out Date: 7/22/2018 2:22:14 PM

Author: AZ Stewart Subject: Sticky Note Date: 7/22/2018 2:22:36 PM

There is no code requirement to use software to generate the answer. FSEC response: We will not refer to software in the final version.

Number: 9 Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:08:47 PM

Plus there is space to include more of the definition of approved since there is no definitions section on this sheet.

by the *code official* as a result of investigation and tests conducted by him or her, or by reason of accepted principles or tests by nationally recognized organizations.

FSEC response: We think including this additional text is not necessary and will make the sentence less clear.

Number: 10 Author: lehma Subject: Highlight Date: 7/19/2018 3:32:11 PM

Number: 11 Author: AZ Stewart Subject: Sticky Note Date: 7/22/2018 1:58:35 PM

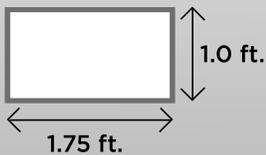
This is the language in the code and more of the document should be referring to it. FSEC response: "Not affiliated with the building design or construction" is not included in R402.4.1.2, but is included in Chapter 1 Section R103.3 regarding examination of documents and R104.4 regarding approved inspection agencies. An authoritative decision whether to include this additional text would be needed.

Test results are reported on a form that includes space to record the home's CFM50 measurement, conditioned volume, ACH50 value and Pass/Fail status, and an area for the tester to provide their name, company, qualification and signature. A blank Building Officials Association of Florida

(BOAF) approved Envelope Leakage Test Report form is available from BOAF and through Florida Energy Code calculation software products. Some Florida building departments require their own version of the form.

You may notice that the BOAF test form shown provides a place to indicate whether the house is complying with the Florida Energy Conservation Code via the Prescriptive, Performance or Energy Rating Index (ERI) method, and

The CFM50 leakage value is proportional to the number and size of cracks and gaps in the building's thermal envelope and can provide an estimate of the combined area of the holes in the envelope. This equivalent hole size is approximated, in square inches, by multiplying the CFM50 result by a 0.13 conversion factor. For example, a home with a measured CFM50 of 1,940 has an equivalent hole size of  $1,940 \times 0.13 = 252.2$  square inches, or 1.75 square feet.



also includes a field to enter the ACH50 from the Performance or ERI compliance form.

For the Performance and ERI compliance methods, using an ACH50 value lower than the code maximum of 7 for the code compliance calculation will help a house pass the code. But since code credit is received for ACH50 values less than 7, if a lower value is entered for compliance, the blower door test must show that the house's leakage is at or below that

lower value (rather than 7). By providing fields to indicate the ACH50 used for compliance, test forms provide project-specific air leakage verification guidance.

For example, if the proposed air leakage was entered on the compliance form as 5 ACH50 but was tested as 6.26, it would fail because 6.26 ACH50 exceeds 5 ACH50. If the builder had proposed 7 ACH50 on the compliance form then 6.26 ACH50 would pass.

If a house's ACH50 is less than 3, Florida Code requires whole-house mechanical ventilation to be provided.

For more information on whole-house mechanical ventilation see the U.S. Department of Energy article: <https://bas.c.pnnl.gov/resource-guides/whole-building-delivered-ventilation#quicktabs-guides=0>.

**Envelope Leakage Test Report (Blower Door Test)**  
Residential Prescriptive, Performance or ERI Method Compliance  
2017 Florida Building Code, Energy Conservation, 6th Edition

Jurisdiction: \_\_\_\_\_ Permit #: \_\_\_\_\_

**Job Information**

Builder: \_\_\_\_\_ Community: \_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_ Lot: \_\_\_\_\_

State: \_\_\_\_\_ Unit: \_\_\_\_\_ Zip: \_\_\_\_\_

**Air Leakage Test Results** *Passing results must meet either the Performance, Prescriptive, or ERI Method*

**PRESCRIPTIVE METHOD:** The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding 7 air changes per hour at a pressure of 0.2 inch w.g. (50 pascals) in Climate Zones 1 and 2.

**PERFORMANCE or ERI METHOD:** The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding the selected ACH50 value, as shown on FORM R405-2017 (Performance) or R406-2017 (ERI), section labeled as infiltration, sub-section ACH50 specified on Form R405-2017-Energy Calc. (Performance) or R406-2017 (ERI): \_\_\_\_\_

CFM(50)  $\times$  60  $\div$  Building Volume = ACH(50)

**PASS**  **FAIL**

When ACH(50) is less than 3, Mechanical Ventilation installation must be verified by building department.

Method for calculating building volume:

Retrieved from architectural plans

Code software calculated

Field measured and calculated

**Testing.** Testing shall be conducted in accordance with ANSI/RESNET/ICC 380 and reported at a pressure or 0.2 inch w.g. (50 Pascals). Testing shall be conducted by either individuals as defined in Section 553.99(3) or (7), Florida Statutes, or individuals licensed as set forth in Section 489.105(3)(f), (g), or (i) or an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, back draft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, if installed at the time of the test, shall be open.
4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.
5. Heating and cooling systems, if installed at the time of the test, shall be turned off.
6. Supply and return registers, if installed at the time of the test, shall be fully open.

**Testing Company**

Company Name: \_\_\_\_\_ Phone: \_\_\_\_\_

I hereby verify that the above Air Leakage results are in accordance with the 2017 6th Edition Florida Building Code Energy Conservation requirements according to the compliance method selected above.

Signature of Tester: \_\_\_\_\_ Date of Test: \_\_\_\_\_

Printed Name of Tester: \_\_\_\_\_

License/Certification #: \_\_\_\_\_ Issuing Authority: \_\_\_\_\_

**Disclaimer:** This piece is intended to give the reader only general factual information current at the time of publication. This piece is not a substitute for professional advice and should not be used for guidance or decisions related to a specific design or construction project. This piece is not intended to reflect the opinion of any of the entities, agencies or organizations identified in the materials and if any opinions appear are those of the individual author and should not be relied upon in any event.

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 Number: 1 Author: AZ Stewart Subject: Highlight Date: 7/22/2018 2:23:23 PM

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 Number: 2 Author: AZ Stewart Subject: Inserted Text Date: 7/22/2018 2:29:45 PM

R405 or R406 FSEC response: We agree with the intent, but we have already twice indicated that this applies to performance and ERI compliance, and just

 adding "R405 or R406" without further explanation is not clear either.

Number: 3 Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:11:33 PM

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 The code does not indicate that the tester is responsible for making sure that the code has been met. However many AHJs want the tester to check. Therefore either don't discuss or add information that on pass point can be obtained. FSEC response: We are not saying the tester is responsible for making sure code has been met here; we are just providing an illustration for the previous paragraph. Whether AHJs want the tester to check this or not, based on research, having a tested ACH50 at or below the value entered for performance or ERI compliance is an important code concept and should be discussed here.

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 Number: 4 Author: AZ Stewart Subject: Sticky Note Date: 7/25/2018 12:10:07 PM

See rationale and comments from Info Guide, which should also be applied here FSEC Response (same as for Info Guide): We will refer to commission approved software instead of BOAF in the final version.

Number: 5 Author: AZ Stewart Subject: Cross-Out Date: 7/25/2018 12:11:45 PM FSEC response: We will refer to commission approved software instead of BOAF in the final version.

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