

Duct & Envelope Tightness (DET) FAQs

v 5-25-16

Information for residential building industry professionals

1. When does the requirement for DET verification go into effect?

Although the new building energy code was implemented as of January 1, 2011, DET verification is not required on residential buildings until June 30, 2011, per the waiver issued on January 18, 2011 by the Georgia Department of Community Affairs (DCA).

2. Who is certified to perform DET verification on a house or duct system?

Excerpted from the Georgia's Supplements and Amendments:

"A certified DET verifier shall be a certified Home Energy Rating Systems (HERS) rater, or be a certified Home Performance with ENERGY STAR contractor, or be a Building Performance Institute (BPI) Analyst, or successfully complete a certified DET verifier course that is approved by the Georgia DCA.¹"

DET verifiers certified under the DET verifier course are listed on the certifying entity's training website. For a list of individuals that successfully completed the Southface DET verifier course, go to www.southface.org. Other certified DET verifiers can be found at the following links:

- Home Performance with ENERGY STAR Contractors at www.gapower.com
- HERS raters at www.resnet.us
- BPI website at www.bpi.org

3. Does the DET verifier need be third party?

No. DET verifiers do not have to be third party. Language concerning third-party inspectors in Appendix C of Georgia's Supplements and Amendments is intended to be adopted by a jurisdiction should it desire a third party to perform inspections for the energy code as a whole and **not** Duct and Envelope Tightness verification.

4. How does one become a certified DET verifier?

To become a certified DET verifier, please visit the Georgia DCA website at www.dca.state.ga.us for a list of approved training entities.

Southface is approved by the Georgia DCA to offer the DET verifier training. For more information or to register for the training, please visit the Southface website at www.southface.org.

¹ "Georgia State Supplements and Amendments to the International Energy Conservation Code" Retrieved from: www.dca.ga.gov

5. *What are the tightness requirements set by the DET verification diagnostic testing?*

The maximum allowable leakage for the building envelope and for duct systems that run external to the building envelope are outlined in Figure A (right).

A home's building envelope must achieve less than 7 air changes per hour at 50 Pascals (7 ACH₅₀).

Duct systems can be tested either at rough in or post-construction with the total leakage test OR at post-construction with the leakage to the outside test.

Rough-In Total (RIT) Leakage must be less than or equal to 6 CFM₂₅ per 100 square feet of conditioned floor area served by that particular duct system.

Post-Construction Total (PCT) Leakage must be less than or equal to 12 CFM₂₅ per 100 square feet of conditioned floor area served by that particular duct system.

Post-Construction Leakage to Outside (PCO) must be less than or equal to 8 CFM₂₅ per 100 square feet of conditioned floor area served by that particular duct system.

6. *When does a duct system need to be tested?*

A newly installed duct system must be tested if *any* part of the duct system or air handler is located outside the building envelope, i.e. in unconditioned space. The test may be performed at rough-in or at final (see question 5 above).

Existing duct systems must be tested and proven tight to the same criteria as new systems if more than 50% of an existing duct system has been modified or altered. Except for longitudinal seams, mastic or mastic tape is required as a sealant for any new or modified ductwork.

When just the equipment (air handler, furnace, air conditioner coil, etc.) is replaced, the duct system is not required to be tested. However, mastic is required to be applied to all plenum connections including air handler holes and seams, as well as plenum to air handler and plenum to collar connections. Additional sealing with mastic beyond the plenum connections is optional.

7. *When does a house need to be tested?*

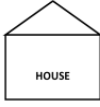
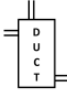
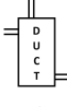

	BET Building Envelope Tightness	< 7ACH₅₀ $\frac{(CFM_{50} \times 60)}{Volume}$
	RIT Rough-in Total Leakage	≤ 6% $\frac{Total\ CFM_{25}}{Floor\ Area\ Served} \times 100$
	PCT Post-construction Total Leakage	≤ 12% $\frac{Total\ CFM_{25}}{Floor\ Area\ Served} \times 100$
	PCO Post-construction Outside Leakage	≤ 8% $\frac{Outside\ CFM_{25}}{Floor\ Area\ Served} \times 100$

Figure A: Maximum allowable leakage for both building envelope tightness

Houses must be tested for building envelope tightness if they are new homes or if they are existing homes that have undergone a renovation that affects the entire building envelope (e.g., gut rehabs).

8. *What are the testing requirements for low-rise multi-family buildings (R-2)?*

Low-rise multifamily buildings (3 stories or less) fall under the residential code. Duct tightness testing must be conducted for these buildings. However, a builder may either have the building tested for envelope tightness or have the units in the building undergo a visual inspection by a third-party.

The visual inspection requires that a third-party inspect each dwelling unit at least two times during construction for the items listed in table 402.4.2 of the energy code and illustrated in Appendix A of Georgia's Supplements and Amendments. If blower door testing multifamily units for envelope tightness, a builder may either sample one in four dwelling units on each floor or follow the sampling protocol described in Chapter 6 of the 2006 Mortgage Industry National Home Energy Rating Systems Standards.

9. *Do additions to houses need to be tested with a blower door for building envelope tightness?*

No, neither additions nor the houses to which they are attached are required to be tested UNLESS the construction affects the entirety of the building envelope (see question 7).

10. *How much does DET verification cost?*

Numbers will vary from location to location and will fluctuate with market conditions, but the price for an envelope (blower door) test on a 2,000 ft² house with one duct system has been estimated to be around \$200². The price for both an envelope and a duct test on that same home has been estimated to be around \$330².

11. *What are the steps to verify the duct and envelope tightness of a home?*

A certified DET verifier must first perform the blower door and duct pressurization diagnostics using the protocol detailed in Appendix B of Georgia's Supplements and Amendments. The results of these tests along with the DET verifier's name and contact information must then be posted on the compliance certificate for the code official to view.

12. *Where do the DET verification results need to be posted?*

² These prices are based on a 2010 Southface poll of 38 individuals from the home performance, HERS and utility industry. On average, individuals thought they would charge \$215 for a stand-alone blower door test (with no home diagnostics) and \$329 for both a stand-alone blower door test and a duct pressurization test.

The results of the DET verification should be included on the compliance certificate to be posted “...on or near the electrical distribution panel or air handler.”³

13. *Where I can I find the equipment needed for the tests?*

There are a number of manufacturers of the blower door and duct pressurization equipment. Among these include: The Energy Conservatory (www.energyconservatory.com), RetroTec (www.retrotec.com), and InfilTec (www.infiltec.com).

14. *What happens if a house or duct system fails the DET verification tests?*

The builder must identify and target leakage through air sealing and duct sealing measures and retest the building and any non-compliant duct system until the failed test is passed. See Appendix A of the Georgia Amendments for detailed information on air sealing practices. Proper assembly and proper application of mastic on joints and seams of mechanical duct systems should yield passing results.

15. *Where can I find more information about DET verification?*

Much of the information from this FAQ list can be found in Georgia’s Supplements and Amendments and the 2009 IECC. Additional resources include:

- 2009 IECC - www.iccsafe.org
- the Southface DET verifier training – www.southface.org along with DET verifier training information and a sample compliance certificate

³ “Georgia State Supplements and Amendments to the International Energy Conservation Code.” Retrieved from: www.dca.ga.gov