# BBS MEMO #405

**Ohio Board of Building Standards** **May 15, 2020** 6606 Tussing Road, P.O. Box 4009, Reynoldsburg, Ohio 43068-9009

## ENERGY EFFICIENCY – DUCT TIGHTNESS TESTING - 2019 RESIDENTIAL CODE OF OHIO (RCO)

With the adoption of the 2019 RCO, the energy efficiency requirements for air leakage (blower door) and duct tightness (duct blaster) testing have changed. Duct tightness testing is addressed here. Air leakage testing is addressed in BBS Memo Energy Efficiency – Air Leakage (#404.)

In new construction, HVAC systems must be sealed, insulated and leak tested (unless specifically exempted) under all compliance paths available to the owner (or the owner's representative) to demonstrate energy efficiency in new construction. RCO Chapter 11, Section 1101.2 states the following:

**1101.2.1 Compliance paths.** Compliance shall be demonstrated by meeting the requirements of one of the following options:

1. *Sections 1101.14 through 1104 of this chapter, or*
2. *Section 1105 (the Simulated Performance approach) and the provisions of Sections 1101.14 through 1104 indicated as "Mandatory," or*
3. *Section 1106 (the Energy Rating Index (ERI) approach) and the provisions of Sections 1101.14 through 1104 indicated as "Mandatory," and Section 1103.5.3, or*
4. *Section 1112 ("The Ohio Home Builder's Association (OHBA) Alternative Energy Code Option"), or*
5. *The "International Energy Conservation Code."*

**The owner, not the building department, decides which compliance path to use and must communicate this choice to the building department.**

Before reviewing the duct tightness testing requirements, users of the RCO must recognize that the OHBA Alternative Energy Code Option (RCO Section 1112) can only be selected for new home construction and was not designed or developed to be able to handle additions or alterations. RCO Section 1112.1.1 *Scope*, states that "*This section provides an alternative set of requirements for regulating the energy efficiency for the design and construction of new buildings regulated by this code.*" Existing dwellings must comply with applicable provisions of RCO Sections 1107 through 1111 or the International Energy Conservation Code (IECC) Chapter 5[RE].

For plans first submitted for approval on or after July 1, 2019, the location of all ductwork and air handling equipment in relation to conditioned space determines when duct tightness testing is required regardless of which method of demonstrating compliance is chosen. RCO Section 1103.3.7 provides requirements for ductwork to be considered in conditioned space; condition #1 addresses duct systems on the conditioned side of the thermal envelope and condition #2 provides requirements for ductwork that is installed within the construction that is the thermal envelope. All other ducts are considered outside conditioned space.

While duct tightness testing is not always required, the sealing of "…ducts, air handlers and filter boxes…" in accordance with RCO Section 1601.4.1 is always required per RCO Sections 1103.3.2, 1112.3.2.2 or IECC Section R403.3.2.

The following summarizes the application of the duct sealing and duct tightness testing provisions:

A. When all ductwork and equipment is located entirely inside the building's conditioned space, all ducts must be sealed; however, no duct tightness testing is required regardless of whether the scope of the project is the construction of a new dwelling or whether the scope of the project is making modifications to an existing dwelling.

B. When any portion of the ductwork or air handling equipment is located outside the building's conditioned space, duct sealing and duct tightness testing of the duct system is required as follows:
   1) **New dwellings:** All ducts must be sealed as stated above and duct tightness testing is required per RCO Sections 1103.3.3, 1112.3.2.2 or IECC Section R403.3.3.
   2) **Addition(s), alteration(s) or repair(s)**: Where ductwork of an existing HVAC system is being replaced, reconfigured, or extended, duct sealing is required to the extent of the alteration; and, duct tightness testing is required when the new ducting (or air handling equipment, if provided) is installed outside conditioned space with one basic exception. The one exception, found in RCO Sections 1108.1.1.2 and 1109.1.2, allows up to 40 feet of duct in unconditioned space before a duct tightness test is required. If 40 or more feet of duct is located in unconditioned space, the duct tightness testing must be performed in accordance with RCO Section 1103.3.3 or IECC Section 403.3.3.

C. When a new, stand-alone, independent heating and/or cooling system is installed to serve an existing building or installed to serve an addition to an existing building, the heating and/or cooling system must be installed and tested as required per RCO Chapter 11, Sections 1107 through 1111 or IECC 2018 Chapter 5[RE]. RCO Section 1108.1.1.2 (IECC Section R502.1.1.2) for additions, RCO Section 1109.1.2(IECC Section R503.1.2) for alterations and RCO Section 1109.2 (IECC Section R502.3) for change in space conditioning, all require the duct system to be sealed and duct tightness testing is required per RCO Section 1103.

If you have further questions regarding the application of these requirements, please call the Board's office at 614-644-2613 or send an E-mail to bbs@com.state.oh.us.