Duct Leakage Test Requirements in Northeast Residential Building Energy Codes

Updated January 2015

Current Res Code	State	Duct Leakage Amendments Adopted
2015 IECC	VT	*Effective March 1, 2015:* Post-construction: 4 CFM-25 Rough-in: 3 CFM-25 (↓), or 3 CFM-25 w/o air handler
	MD	No changes
2012 IECC	MA	No changes
	RI	Post-construction: 8 CFM-25 (↑) Rough-in: 6 CFM-25 (↑), or 4 CFM-25 (↑) w/o air handler
	DE	Post-construction: 6 CFM-25 (↑) Rough-in: 6 CFM-25 (↑), or 4 CFM-25 (↑) w/o air handler
	DC	Post-construction: 8 CFM-25 (↑) Rough-in: 8 CFM-25 (↑), or 4 CFM-25 (↑) w/o air handler
2009 IECC	CT	No changes
	NH	
	NY	
	PA	
	NJ	No technical changes, but testing was not enforced until Jan 2013
2009 IECC (not statewide)	ME	No technical changes, but communities with less than 2,000 residents are exempted from adopting the 2009 IECC.

Note: The arrows (↑ , ↓) indicate where limits were raised or lowered, respectively, with respect to the corresponding model code.

2012 / 2015 IECC duct leakage requirements:

- Post-construction: total leakage ≤ 4 CFM-25/100 ft^2 of conditioned floor area
- Rough-in: total leakage ≤ 4 CFM-25/100 ft^2 of conditioned floor area; OR ≤ 3 CFM-25/100 ft^2 without air handler

2009 IECC duct leakage requirements:

- Post-construction: total leakage ≤ 12 CFM-25/100 ft^2 of conditioned floor area; OR leakage to outside ≤ 8 CFM-25/100 ft^2 of conditioned floor area
- Rough-in: total leakage ≤ 6 CFM-25/100 ft^2 of conditioned floor area; OR ≤ 4 CFM-25/100 ft^2 without air handler

Duct Testing – Total Duct Leakage vs. Leakage to Outside

Duct testing consists of pressurizing ductwork with a small, calibrated fan called a duct blaster and reading the airflow needed to do this with a manometer. There are two duct leakage tests used by building codes and standards: total duct leakage and leakage to outside.

The total duct leakage test quantifies ALL of the air leaking from the ductwork. This test involves pressurizing the ducts to +25 Pascals with respect to (wrt) the home, and measuring resultant airflow rate in cubic feet per minute (cfm). The duct blaster can either be connected to the air handler cabinet or to a large return. All of the registers are first sealed off (typically with tape) to isolate the ductwork from the building. The testing method for the total duct leakage test is very similar to that of a blower door test:

Test Steps	Building Air Leakage (blower door)	Total Duct Leakage (duct blaster)
1. Isolate zone to be tested	Close all windows/doors. Turn off all mechanical ventilation / ensure dampers are closed.	Seal off /tape all registers. Ensure the home and outside are at a common pressure by opening an exterior door/window.
2. Set up equipment for testing	Assemble blower door and place in door frame. Connect two hoses to the manometer: one goes outside, the other connects to the fan.	Connect duct blaster to air handler cabinet (or large return). Connect two hoses to the manometer: one goes in supply closest to the plenum (with static pressure probe attached), the other connects to the fan.
3. Get Baseline reading	Baseline home wrt outside (cover on)	Baseline ductwork wrt home (shroud on)
4. Pressurize / Depressurize	Depressurize home to -50 Pa wrt outside	Pressurize ductwork to +25 Pa wrt home
5. Get a reading	When fan stabilizes, read flow (cfm) from manometer	When fan stabilizes, read flow (cfm) from manometer.

The leakage to outside test, on the other hand, quantifies the "energy loss" – the amount of conditioned air that is leaking from ducts outside the building's pressure boundary. Having leakage to the *in*side means the air isn't going where is designed to, but it is at least staying in the home. When running the test, the main differences from the total leakage test are that (1) the leakage to outside test involves running a blower door and a duct blaster simultaneously, and (2) the registers do not need to be sealed off.

First, the house is pressurized to +25 Pascals wrt outside (as opposed to being *de*pressurized to -50 Pascals wrt outside, as in the normal blower door test). At this point, any connection between the ductwork and the outside will cause a slight depressurization of the ducts. The duct blaster is then ramped up (if necessary) until this difference is equalized, and the airflow needed to maintain this pressure is read off the manometer.