

Building Air Leakage Testing

Washington State Energy Code (WSEC) section 502.4.5 requires air leakage testing for all new houses. The requirement is met if the house has a *Specific Leakage Area (SLA)* of .00030 or less. SLA is an estimate of a home's leakage area, in square inches, under "typical" conditions, divided by the conditioned floor area of the home. The test must be performed using a Blower Door device which consists of a large fan, a frame and panel. A manometer (pressure gauge) is used to read house and fan pressures.

WSEC states that the test may be performed at any time after rough in. All penetrations in the building envelope must be sealed including those for utilities, plumbing, electrical, ventilation and combustion appliances. The code also states that when required by the building official, the test shall be conducted in the presence of department staff. An air leakage test is not required for additions less than 750 square feet.



To conduct the test:

1. Close all windows, doors and fireplace and stove doors.
2. Close all dampers including exhaust, intake, make-up air, backdraft and flue dampers. Since you will be depressurizing the house, dampers in bath fans, etc. will be sucked closed during the test and will therefore not negatively affect the results.
3. Make sure plumbing traps are filled with water.
4. Leave doors between heated areas open.
5. Open access hatches to conditioned attics and/or conditioned crawl spaces.
6. Seal exterior openings for continuously operating ventilation systems and heat recovery ventilators.
7. Turn off heating and cooling systems but do not seal supply or return registers.
8. Adjust all combustion appliances so that they do not turn on during the test.
9. Install the blower door in an exterior door opening and connect hoses from the manometer to the blower door fan and the exterior pressure tap. See manufacturer's instructions for correct set-up.
10. Depressurize the house to -50 Pascals.

11. Record the flow rate (with simple manometers, the fan pressure (Pa) is converted to CFM₅₀ using a flow table. Many digital manometers sold with blower doors can automatically perform this conversion, and display CFM₅₀ directly.) Consult your blower door and manometer manuals.

You now must convert the flow rate (CFM50) to SLA. Use the following formula:

$$SLA = (CFM50 \times .055) / (CFA \times 144)$$

Where: SLA = Specific Leakage Area
CFM50 X .055 = Blower door fan flow rate at 50 pascal pressure difference, converted to a conversion factor (SLA reference pressure)
CFA x 144 = Conditioned floor area of the housing unit, converted to square inches

Example: A blower door test has been done on a 2,000 square foot house and the fan flow (CFM50) rate is 1100 CFM.

$$SLA = (CFM50 \times .055) / (CFA \times 144)$$

$$SLA = (1100 \times .055) / (2000 \times 144)$$

$$SLA = 60.5 / 288,000$$

$$SLA = .00021$$

Since the code requires the SLA to be less than .00030, this house complies with an SLA of .00021. Record the SLA on the energy certificate on or near the electrical panel.