

Air Leakage Testing

Washington State Energy Code (WSEC) section 502.4.5 requires air leakage testing for all new houses or major remodels. 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.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed.
2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft, and flue dampers;
3. Interior doors connecting conditioned spaces shall be open; access hatches to conditioned crawl spaces and conditioned attics shall be open; doors connecting to unconditioned spaces shall be closed but not sealed;
4. Exterior openings for continuous operation ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s) shall be turned off;
6. HVAC ducts supply and return registers shall not be sealed.

Duct Leakage Sealing and Testing

Leakage Testing: Ducts shall be leak tested in accordance with RS-33, using the maximum duct leakage rates specified in Section 503.10.3

Sealing: All ducts, air handlers, filter boxes, and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.3 of the International Residential Code or Section 603.9 of the International Mechanical Code. Duct tightness testing shall be conducted to verify that the ducts are sealed. A signed affidavit documenting the test results shall be provided to the jurisdiction having authority by the testing agent. When required by the building official, the test shall be conducted in the presence of department staff. Duct tightness shall be verified by either of the following:

1. Post-construction test: Leakage to outdoors shall be less than or equal to 6 cfm per 100 square feet of conditioned floor area or a total leakage less than or equal to 8 cfm per 100 square feet of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pascals) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 6 cfm per 100 square feet of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pascals) across the roughed-in system, including the

manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm per 100 square feet of conditioned floor area.

EXCEPTIONS: 1. Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

2. Duct tightness test is not required if the furnace is a nondirect vent type combustion appliance installed in an unconditioned space. A maximum of six feet of connected ductwork in the unconditioned space is allowed. All additional supply and return ducts shall be within the conditioned space. Ducts outside the conditioned space shall be sealed with a mastic type duct sealant and insulated on the exterior with R-8 insulation for above grade ducts and R-5 water resistant insulation when within a slab or earth.

Recessed Luminaires: When installed in contact with the building envelope, recessed luminaires shall be Type IC rated and certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity.