



From The Home Inspector

Radon Testing Considerations in Real Estate Transactions

by John Woodmansee

Seventy-percent of all radon testing is done at home-sale time, and most is done by home inspectors. Most testing can be done in a short sampling period (2-4 days); and it is in the best interest of the home buyers (and real estate agents) to know the radon level because of health consequences of excessive exposure. Radon measurement seems like a simple task, but the problems of sampling and validity of results are complicated. Testing is best left in the hands of trained professionals (see last month's article).

Preparing for a Radon Test

1. Tests 2-4 days long require closed-house conditions; 90+ day tests don't have the "closed" restriction.
2. 12-hour wait after shutting windows and doors
3. Test when people using the house can follow protocol. Normal entry/exit OK, closing door each time. Testing new homes poses a special problem because workers expect to be able to have windows and doors open & don't pay attention to signs.
4. Check air handling equipment that could affect results:
 - Furnace/air handler blower in 'AUTO' mode, not 'ON' continuously
 - Fireplaces not in use, and dampers shut
 - Radon mitigation system blower ON 24 hours in advance
 - Whole house and window fans OFF
5. Leave printed information for all who use house (door tags, an agreement form to sign on the kitchen counter, warning sign at the tester)

Test Location

1. Lowest level that COULD be occupied or finished (Do non-real estate tests in the lowest occupied space).
2. Choose a room that is frequently used (e.g. family room and bedrooms).
 - Minimum 20" from floor; minimum 36" from a door or window opening in exterior walls, otherwise, 12" from exterior walls; 4" of air space around the device
 - Out of the path of direct air drafts and sunlight (these conditions drive radon off)
 - Avoid areas of high humidity (e.g. bathrooms and kitchen of an occupied home)
 - Avoid areas with solvent vapors (e.g. paint thinner)
3. Influences while testing for radon
 - Best to test when weather is warm days and chilly nights, like in the Spring or Fall. Why? Because those days are a fair sample of our weather. Radon levels increase when the house is warmer than the air outside (this is the "stack effect" at work, creating a suction effect, low in the house, that draws-in outside air (including soil gases). This is a major dynamic for radon entry (and drafty rooms). Expect radon levels to be highest in cold weather, lowest in summer. So test both in cold and hot weather, & average the results.
 - Avoid testing during bad weather (strong, persistent winds, stormy). The barometric pressure drops and more radon gas emerges from the soil. High winds (>30MPH) affect the air pressure inside the house & can increase radon.
 - Avoid times when heavy rains soak the soil and make it hard for soil gases to emerge from saturated soil. Modest, typical rainfall is inconsequential.

Testing Methods: Their Advantages & Limitations

1. **Activated Charcoal in canisters or bags:** Inexpensive and simple to store and use (deploy in pairs). Analysis is done by others so results are delayed about a week. Result is average exposure, and is biased toward conditions near the end of the test. High moisture gain creates an under estimate of radon, but the lab may be able to correct for this.
2. **Alpha Track film in a small container:** Inexpensive and simple to use. Analysis in a lab takes several weeks. Result is an average radon level. Limited to long-term testing.
3. **Electret Ion Chamber:** Reusable plastic electrets, used in pairs, that can do short or long term tests. Operator gets immediate result, an average of radon exposure. Sensitive galvanometer, its upkeep & calibration are expensive.
4. **Continuous Radon Monitor (CRM):** Provides immediate, hourly data on radon level and physical movement of the CRM (plus some also measure temperature, humidity, & barometric pressure). Operator can see what happened during the test period and make a judgment about the test's validity. Data collection limited to 96 hours. Some CRM's need 120 volt power. Expensive to buy, maintain and calibrate properly.