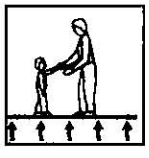
Radon Facts

Radon Defined

Radon is a radioactive gas which is difficult to detect because it can't be seen, smelled, or tasted. It comes from the decay of radium and exists in varying amounts in most soils, including those in Iowa.

The radon in soil is gaseous, so it can move through fissures and cracks in the soil. It then reaches the atmosphere or enters a home. In outdoor air, radon is diluted to such low concentrations that it is relatively harmless. Inside a building, the level of radon depends on the type of construction and the concentration of radon in the underlying soil. Levels can vary greatly from house to house on the same street or in the same town. Homes with high levels have been found everywhere in Iowa.

Health Concern



Unlike many indoor air pollutants, radon does not cause headaches, nausea, or other similar symptoms. Prolonged exposure to high levels or radon can lead to lung cancer, which is radon's only known adverse effect.

Radon is considered to be the leading cause of lung cancer among nonsmokers in the United States. Scientific studies have estimated that radon is linked to about 13,000 lung cancer deaths each year in the U.S. Based on population, Iowa would be expected to have approximately 150 radon-linked lung cancer deaths annually.

Radon is one part of a long chain of radioactive atoms. Radon gas in the air decays into solid decay products, which are also radioactive. These can attach to dust particles that can be inhaled and then remain in the lungs to release tissue-damaging radiation. The solid-decay products are actually more dangerous than the radon gas itself.

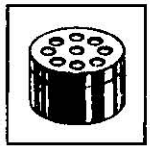
Certain groups of people are at higher risk from long-term exposure to elevated levels of radon. Young children are at particular risk because their lungs are still developing and the sensitive tissue is more easily damaged. Cigarette smokers face a risk about 10 times greater than that of nonsmokers because radon decay products cling to smoke particles in the air and are inhaled.

Radon in Homes

Although radon's existence in the air has been known for a long time, its presence in homes was not detected until about 1970, when houses in Colorado that were built over waste from old uranium mines were found to have very high levels of radon. Since then, cases of high indoor radon levels have been found in most parts of the U.S.

Radon can enter a house in several ways. It moves from the soil into the basement or lowest level of the house through openings such as cracks, loose-fitting pipes, sumps, exposed dirt floors, slab joints, or porous block walls. Although much less important in Iowa, water supplies and building materials are two other possible points of entry.

Testing for Radon



It is recommended that all Iowa homes be tested for radon. Only individual testing of houses can determine which houses may have a radon problem. Even a radon expert cannot determine by inspection whether a building has a high radon level. Radon gas concentrations can be measured with a simple monitoring device. Two types are commonly used. Both are inexpensive, easy to use and can be used only once.

A short-term detector (such as a charcoal canister or pouch) is left in place for two to seven days. This type of detector is useful for a quick screen of the radon level, which can indicate the potential for a problem and the need for additional testing. A short-term detector should be placed in the lowest livable level of the house, preferably during the winter months.

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A long-term detector (such as track-etch) is left in place for three months to one year. This provides a long-term average of radon levels which may vary at different times of the year. Long-term detectors are generally placed in the main living areas of the house.

Interpreting the Reading

A radon reading tells how much radon was present in the home during the test period. This level will depend on many things, including where the detector was placed, the time of year, the operation of fans in the home, and the weather tightness of the home. Radon levels are generally highest when the house is closed up and when the detector has been placed in the basement or near possible radon entry points. Readings for the entire year are usually lower than those taken in a basement during the winter. Radon gas is measured in "picocuries per liter" (abbreviated pCi/L), a scientific measure of radioactivity. The EPA has set 4 picocuries per liter as an "action guideline." If the annual average radon level in the home exceeds this number, the EPA suggests that action be taken to reduce radon levels. Radon screening levels are categorized as low, medium, high and very high. These are interpreted as follows.

• Low — less than 4 picocuries per liter. It is not necessary to take further action unless you desire to, but it is recommended that a long-term test be carried out in the lived-in levels of the house to provide an accurate determination of the annual average radon level.

• Medium — 4 to 20 picocuries per liter. It is recommended that long-term tests be carried out, and, if the annual average radon level appears to fall in this range, to take steps within the next few years to reduce the average radon level to below 4 pCi/L.

• High — 20 to 200 picocuries per liter. Take action at once to verify the presence of high readings, and then, if the annual average is estimated to fall in this range, take steps within the next few months to reduce radon levels to below 4 pCi/L.

• Very High radon levels — over 200 picocuries per liter. Take immediate action to verify these levels and, if verified, take steps within the next few weeks to reduce radon levels to below 4 pCi/L.

Radon in Iowa Homes

In Iowa, surveys by Iowa State University Extension and the EPA have found that about 70 percent of Iowa homes have radon screening tests above 4 pCi/L. This is higher than any of the other states tested by the EPA. Many of these homes would probably not meet the EPA's guidelines of an annual average radon level below 4 pCi/L. Homes with low radon levels are found in all parts of Iowa, as are homes with high radon levels. Homeowners cannot rely on radon testing in their neighborhood to estimate their own radon level. Each home needs to be tested separately.

Reducing High Levels

Radon mitigation (the reduction of high levels of radon in a building) generally requires a trained professional. Homeowners who have tried to reduce radon levels on their own have rarely been successful. In Iowa, radon mitigators are required by law to meet requirements fixed by the Iowa Department of Public Health, which maintains a list of credential mitigators allowed to work in the state.

The most effective method, and the one recommended for homes with a severe radon problem, is the installation of a fan-driven ventilation system under the basement slab (or floor slab or around the basement walls of a home). Such a system has generally cost homeowners about $1,000 to $2,000 and has typically brought radon levels down to 2 pCi/L or less.

For More Information

Iowa State University operates Answerline, a toll-free hotline at 1-800-262-3804 (TDD: 1-800-854-1658). Contact them with questions about radon and health, where to get a radon detector, or what to do if you have a radon problem.

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