

Radon Fact Sheet



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What is radon?

Radon is a naturally occurring radioactive gas. It is produced in the ground through the normal decay of uranium and radium. As it decays, radon produces new radioactive elements called radon daughters or decay products. Radon and radon daughters cannot be detected by human senses because they are colorless, odorless, and tasteless.

Where does radon come from?

Radon originates in the ground and can be found in soil and rocks. As with any gas, radon diffuses as it flows along the path of least resistance to the surface of the ground before entering the atmosphere. Once it enters the atmosphere, radon becomes diluted in the outdoor air and concentrations are so low that it is of minor concern.

Since it is a gas, radon can also move into any air space, such as basements, crawl spaces, or caves. Once inside an enclosed space, such as a home, radon can accumulate. For this reason, indoor concentrations are usually higher than those found outdoors. Houses with little air exchange because of improvements to prevent heat loss will generally have higher indoor radon levels than draftier houses.

How does radon get into homes?

Radon moves through small spaces in the soil and rock on which a house is built and can seep into a home through dirt floors, floor drains, sump pits, joints, or tiny cracks and pores in hollow-blockwalls. As a result, radon concentrations tend to be greater in the lower levels of a home, such as the basement.

Radon can also dissolve in well water and contribute to airborne radon in homes when released through running water. Studies indicate that very few public groundwater supplies contain enough radon to be a significant source of radon in homes. There is very little radon in surface water supplies because the water is exposed to outdoor air, thus diluting the radon concentrations.

Is exposure to indoor radon harmful?

When radon undergoes radioactive breakdown, it decays into other radioactive elements called radon daughters. Radon daughters are solids, not gases, and stick to surfaces such as dust particles in the air. If contaminated dust is inhaled, these particles can adhere to the airways of the lung. As these radioactive dust particles break down further, they release small bursts of energy which can damage lung tissue and therefore increase the risk of developing lung cancer. In general, the risk increases as the level of radon and the length of exposure increases.

Radon itself, on the other hand, is almost chemically inactive and an inhaled radon atom is very likely to be exhaled before it decays. Thus, the main health risk from radon is exposure to its decay products.

What can be done to reduce exposure to indoor radon?

The federal government has studied the effectiveness of various ways to reduce high concentrations of radon in homes. The most obvious remedy is to increase ventilation of the home which allows the radon to escape.

Another approach is to prevent radon from getting into the home, but determining how the gas enters a building poses a major difficulty. A booklet describing several methods to reduce high concentrations of radon can be obtained from the Massachusetts Department of Public Health's Radiation Control Program.

High levels of radon are reduced through a mitigation system installed into the home. The most common type of system is called sub-slab depressurization. The EPA does not advocate the sealing of cracks in the basement floor as a single approach to solving a radon problem.

. Although there are no Massachusetts state or federal regulations for naturally occurring radon or radon daughters, the Environmental Protection Agency (EPA) has recommended guidelines for taking action. Concentrations of radon gas are measured as "picocuries per liter" (pCi/l). The EPA suggests that if an initial screening measurement results in a reading greater than 4 pCi/l, further measurements should be taken to determine the annual average exposure to radon and that action be taken within a reasonable period of time. The Massachusetts Department of Public Health's Radiation Control Program will assist you in obtaining further measurements.

How can I find out if my home has radon?

The Massachusetts Department of Public Health, Radiation Control Program in conjunction with the EPA did a study in 1988, and with the data obtained it is possible to estimate the potential of radon problems by county. The data shows that one out of four houses may have levels above the 4pCi/L action level however, the only way to know if your home has a radon problem is to do a radon test.

If you have further questions on radon, you may call the Radiation Control Program and they will advise you on how to get your home tested and assist you in interpreting the results.

Where can I get further information?

Massachusetts Department of Public Health
Radiation Control Program
(617) 727-6214
(800) RADON95
(413) 586-7525