

Understanding and Addressing Radon in Crawl Space Issues

If you own a home with a crawl space, you already know the challenges that come with that low, unfinished area. It is a place where plumbing runs, where ductwork snakes through, and where the ground beneath your living space stays in direct contact with the house. What many homeowners do not realize is that a crawl space can also be a direct pathway for soil gas to enter the home. And when that soil gas contains radon, the problem becomes a health concern that deserves serious attention.

Radon is a naturally occurring radioactive gas that forms from the decay of uranium in soil and rock. It moves up through the ground and into the air. When it seeps into a building through cracks, gaps, or porous materials, it can accumulate to levels that pose a long-term health risk. The EPA estimates that radon causes thousands of lung cancer deaths each year, and it is the second leading cause of lung cancer after smoking. For homes with crawl spaces, the risk is often higher because the crawl space acts like a large, open plenum under the house, collecting soil gas before it migrates into the living areas above.



Why Radon in Crawl Space Is Different From Radon in Basements

A basement is a finished or semi-finished room with a concrete floor and walls. It is a contained space. A crawl space, on the other hand, is typically unfinished, with a dirt floor or a thin layer of gravel over soil. That means the soil gas has a much larger surface area to enter from. Even if you have a concrete slab in part of the crawl space, the edges and any cracks can allow radon to seep in. In many homes, the crawl space is vented only passively, if at all, so the air inside it can become stagnant and highly concentrated with radon.

When I inspect homes for [radon in crawl space](#) issues, I often find that the crawl space is essentially a reservoir of radon-laden air. The house above it acts like a chimney, drawing that air upward through floor joists, plumbing penetrations, and electrical openings. This is called the stack effect. The result is that even if your living areas are several feet above the crawl space, you can still have elevated radon levels in your first-floor rooms. The crawl space itself may never be occupied, but it directly affects the air you breathe.

Testing Is the First Step

You cannot know if you have a radon problem without testing. A simple, short-term radon test placed in the lowest livable area of your home will give you a preliminary reading. But for crawl space homes, I recommend a more thorough approach. Place a radon detector in the crawl space itself, if it is safe to access, and another in the living area directly above it. This will tell you two things: how much radon is in the crawl space, and how much of that radon is making its way into your home.

Many homeowners are surprised to find that their crawl space radon levels are several times higher than the EPA action level of 4 picocuries per liter, even when their living area levels are below that threshold. That does not mean you are safe. The crawl space is a source, and it will only get worse as the house settles and more cracks develop. A professional radon test from a company like Air Sense Environmental in St. Louis can give you accurate, reliable results and help you decide what to do next.

Mitigation Strategies for Crawl Spaces

Once you know you have radon in crawl space, the next step is mitigation. The most effective system for a crawl space is usually an active soil depressurization system, also called sub-slab depressurization when applied to a slab. But in a crawl space, the approach is slightly different. Instead of pulling air from under a concrete slab, you are pulling air from under a polyethylene vapor barrier that covers the dirt floor. The vapor barrier is a thick plastic sheet that seals the

soil, preventing soil gas from entering the crawl space air. It is laid over the entire floor, overlapped at the seams, and sealed to the walls and any penetrations with caulking.

Under that vapor barrier, a network of perforated pipes or a sealed sump hole is installed. A radon fan is connected to these pipes, and it runs continuously, creating a vacuum that pulls soil gas from beneath the barrier and vents it safely above the roofline. This is called active soil depressurization, and it is the gold standard for crawl space radon mitigation. The fan must be sized correctly for the space, and the system must include a manometer, often a U-tube manometer, so you can see at a glance that the system is working. If the manometer shows a steady pressure difference, you know the fan is pulling properly. If it drops to zero, something is wrong.

In some cases, the crawl space may already have a concrete slab, but it is cracked or poorly sealed. In that situation, we may still need to install a vapor barrier over the slab, or seal the cracks and install a sub-slab depressurization system. The goal is always the same: stop the soil gas from entering the crawl space air, and vent it outside before it can get into your home.

Post-Installation Verification and Ongoing Maintenance

After the system is installed, you cannot just walk away. A proper mitigation job includes post-installation verification. This means running another radon test in the same locations as before, to confirm that levels have dropped below the EPA action level. In St. Louis, where soil conditions vary widely from clay to limestone, verification is especially important. A system that works perfectly in one neighborhood may need adjustment in another.



Post-installation verification also includes checking the manometer regularly. I tell homeowners to look at it once a month, just like checking a smoke alarm battery. If the

manometer shows no vacuum, the fan may have failed or the system may have a leak. Some modern systems come with an alarm that sounds if the fan stops, but even with that, a visual check is good practice. The radon fan itself should last many years, but it is a mechanical device and will eventually need replacement. Most good mitigation companies offer a mitigation system warranty that covers parts and labor for a set period, so ask about that before you choose a contractor.

Additional Measures That Help

Beyond the active system, there are other steps you can take to reduce radon in crawl space. Sealing all floor penetrations and crawl space access doors with caulking is a simple but effective measure. Foundation repair, such as fixing cracks in the stem wall or sealing the sill plate area, can also reduce air leakage. If your crawl space has a sump pump, make sure the sump hole is sealed with a gasketed lid. That hole is often a major entry point for soil gas.

A polyethylene vapor barrier is not just for new construction. In many older homes, the crawl space has no barrier at all. Installing one is a labor-intensive job, but it pays off. The barrier must be thick enough to resist punctures, and all seams must be overlapped and taped. If you have standing water in the crawl space, you may need to address drainage first, because a vapor barrier over wet soil will trap moisture and cause mold. In that case, a combination of foundation drainage work and vapor barrier installation may be needed before the radon system goes in.

The Bottom Line on Radon in Crawl Space

Radon in crawl space is a solvable problem, but it requires a tailored approach. You cannot treat a crawl space exactly like a basement, because the construction is different and the air dynamics are different. A professional who understands crawl space mitigation will know how to design a system that works for your specific home. In St. Louis, Air Sense Environmental has the experience to handle these tricky installations, from testing through post-installation verification and beyond.

If you are buying a home with a crawl space, include a radon test in your inspection. If you already live in one, test it now. The cost of testing is small compared to the peace of mind it brings. And if your levels are high, do not wait. Radon health risk is cumulative, and the longer you are exposed, the greater the risk. A properly designed and maintained active soil depressurization system can reduce your radon levels by 99% or more, and it will run quietly and efficiently for years.

Your crawl space may be out of sight, but it should never be out of mind. With the right approach, you can keep your home safe and your family breathing easier.