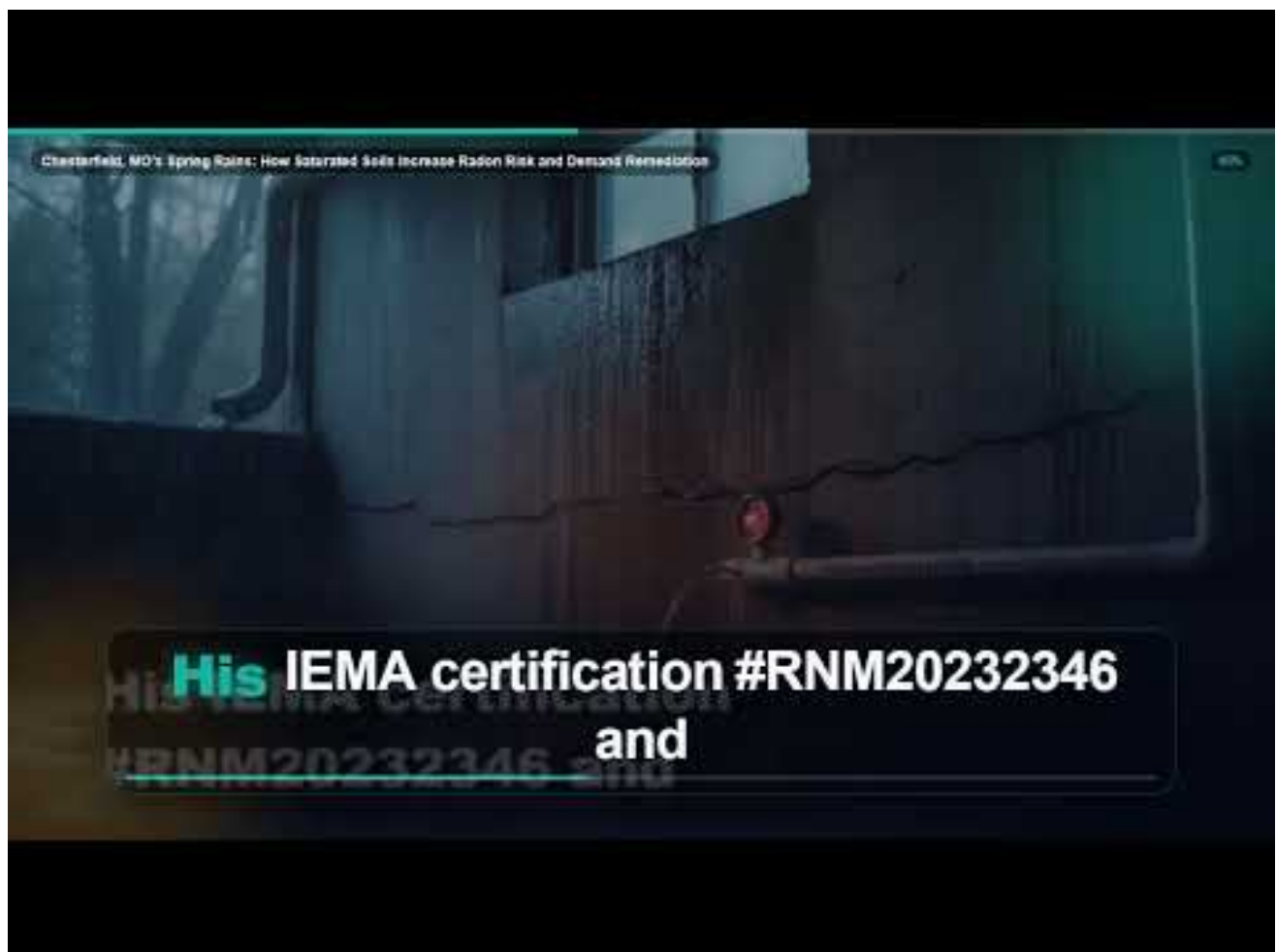


What You Need to Know About Radon Fan Installation for an Effective Mitigation System

When I first started working in radon mitigation, the fan was just a component. After a few years in basements and crawlspaces around St. Louis, I learned it is the heart of the whole system. A well-done radon fan installation can mean the difference between a home that tests at 4.0 pCi/L and one that drops to 0.8. The fan has to pull soil gas from under the slab, push it through the pipe, and discharge it above the roofline without losing pressure or creating noise problems. This is not a job for guesswork.

I have seen homeowners try to save money by buying a fan online and installing it themselves. Sometimes they get lucky. More often, the fan motor burns out within a year because the system was not sized for the soil conditions, or the discharge point vents too close to a window and draws radon gas right back inside. A professional radon mitigation contractor understands the interplay between soil permeability, pipe routing, and fan performance curves. That knowledge is what makes the installation reliable for decades.



Why the Fan Matters in Radon Mitigation

Radon is a radioactive gas that comes from the natural decay of uranium in soil. It moves through the ground and enters buildings through cracks in the basement slab, gaps around pipes, and openings in crawlspace walls. The most common and effective way to stop it is active soil depressurization, also called sub-slab depressurization. This method uses a fan to create a vacuum beneath the concrete floor, pulling radon-laden air through a soil pipe and venting it safely outside. The fan installation is the step that makes the vacuum possible. Without a correctly placed and wired fan, the system is just a hole in the floor with a pipe sticking out.

The fan itself is usually a small, in-line centrifugal unit designed to run continuously for years. It sits in the attic or on the exterior wall, connected to the pipe that goes through the basement slab. The fan motor has to be rated for continuous duty and should be sized to overcome the static pressure of the soil and the pipe run. An undersized fan will not pull enough vacuum. An oversized one can create excessive noise and may cause the system to short-cycle, which wears out the motor faster. A good mitigation contractor will measure the sub-slab pressure field extension and choose a fan that matches the specific house.

Steps in a Professional Radon Fan Installation

Every job is different, but a typical installation follows a sequence that has been refined over decades of work in St. Louis and elsewhere. The first step is radon testing. A short-term radon detection kit placed in the lowest livable area for two to seven days gives a baseline reading. If the result is above the EPA action level of 4.0 pCi/L, mitigation is warranted. But testing does not stop there. After the system is installed, post-installation verification confirms that the fan is actually reducing radon levels. That verification is required by most state guidelines and is the only way to know the job was done right.

Once the test confirms a problem, the contractor drills a hole through the basement slab or crawlspace floor, usually four to five inches in diameter. A section of soil pipe is inserted into the hole, and the gap around the pipe is sealed with hydraulic cement or polyurethane caulk. The pipe runs vertically up the wall, through the floor joists or attic, and exits through the roof. At the highest point, the pipe terminates in a discharge point that directs the radon gas upward and away from windows, vents, and occupied spaces. The fan is installed inline, typically in the attic or on an exterior wall, where it can be accessed for maintenance but is not in the way.

The fan installation itself involves mounting the fan securely, connecting the electrical wiring according to local code, and verifying that the manometer shows the correct negative pressure. A manometer is a simple U-tube gauge that indicates whether the system is pulling vacuum. When the fan runs, the manometer should show at least 0.5 inches of water column,

ideally more. If the reading is too low, the contractor might need to add more suction points or adjust the fan speed. This is where experience matters. I have seen installations where the manometer was installed backward, or the fan was wired to a switch that the homeowner kept turning off. Those issues are easy to avoid when you know what to look for.

Common Mistakes in Radon Fan Installation

The most common mistake I see in DIY installations is using the wrong type of pipe. Some people use standard PVC drain pipe, which can collapse under the vacuum or degrade in sunlight. Schedule 40 PVC or ABS is the standard for radon mitigation because it can handle the continuous negative pressure. Another mistake is placing the fan too close to the discharge point. If the fan is within a few feet of the roof vent, moisture can condense inside the pipe and drip back onto the fan motor, causing early failure. The fan should be at least ten feet from the discharge point on the pipe run, with a slight slope to allow condensation to drain back to the soil.

Electrical issues are also common. The fan must be connected to a dedicated circuit with a proper ground. Some homeowners plug the fan into a standard outlet that shares a circuit with other appliances, leading to tripped breakers and a system that shuts off. A good installation includes a dedicated outlet or hardwired connection with a visible indicator light so the homeowner can see at a glance whether the fan is running. That light is a simple but powerful tool. When it is off, the system is not working, and the homeowner knows to call for service.



Post-Installation Verification and Long-Term Performance

After the fan is running, the contractor performs a post-installation verification test. This usually involves placing another radon detection kit in the same location as the initial test and running it for at least 48 hours. The EPA recommends that the test be conducted with the system operating, and the results should show a reduction to below 2.0 pCi/L, ideally lower. I have seen systems bring levels from 12 pCi/L down to 0.5 pCi/L. That kind of reduction is possible when the [radon fan installation](#) is done correctly, with proper pipe sizing, fan selection, and sealing.

Long-term performance also depends on maintenance. The fan motor should run continuously. Turning it off for extended periods allows radon levels to build back up. The manometer should be checked periodically to confirm the system is still pulling vacuum. If the reading drops, there may be a blockage in the pipe or a leak in the sub-slab seal. A professional inspection every few years can catch problems before they affect indoor air quality. Air Sense Environmental recommends checking the manometer at least once a year and after any major renovation that could disturb the slab or pipe.

Choosing a Mitigation Contractor in St. Louis

St. Louis sits on top of some of the highest radon potential in the country, according to the EPA's Zone 1 designation. That means every home in the region should be tested, and many will need a radon mitigation system. When you hire a contractor, ask about their experience with sub-slab depressurization and radon fan installation specifically. A contractor who has installed hundreds of fans will know how to handle different soil types, pipe routing challenges, and local code requirements. They will also carry the right equipment, like a manometer and a pressure field extension tester, to verify the system works before they leave.

I have worked on homes where the soil was so tight that we had to install multiple suction points to get the vacuum to spread across the entire slab. I have worked on crawlspaces where the only option was to run the pipe through an exterior wall and mount the fan on a bracket. Every house is different, and a good contractor adapts. That is why the phrase "radon fan installation" covers so much more than just bolting a fan to a pipe. It is the entire process of designing and building a system that will keep a family safe for years.

If you are considering radon mitigation, start with a test. Then talk to a contractor who understands the science and the craft. A properly installed fan, connected to a well-sealed soil pipe and verified with post-installation testing, is the most reliable way to reduce radon gas in your home. Do not settle for less.