References

Getting rid of indoor radon



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Uponor's radon system was installed in a detached house in Ilomantsi, completed in 1987. Previously, the radon values in the house were 1,188 becquerels. After installing the system, the radon values dropped to 83.
Markku Savola's two-storey detached house was renovated, thanks to which the radon concentration in the indoor air was controlled and reduced. At worst, radon increases the risk of lung cancer.

Project Facts:

Location	Completion
Ilomantsi, Finland	2014
Building Type	Product systems
Single homes	Ventilation
Project Type	
New building	

Markku Savola is pleased with Uponor's radon removal system, which was installed in October 2014 in his house in Ilomantsi, on the northern shore of Lake Mekrijärvi. After the renovation was completed, Savola measured the radon concentration in the indoor air - the results were surprising.

- We are satisfied with the radon repair and the work of the contractors. The radon concentration in the downstairs room was as high as 1,188 becquerels before the radon renovation, but dropped to 83 after the radon system was installed. A similar decline was also seen upstairs, where radon values fell from 621 becquerels to 20, Savola says.

Savola had long been planning the project because he knew the health risks of radon-containing air. For example, the recommendations of the Radiation and Nuclear Safety Authority (STUK) state that in an old house, the concentration of radon in the indoor air exceeding the limit value of more than 200 becquerels gives cause for renovation. The reason is that when exposed to indoor air, radon is a health risk that increases the susceptibility to lung cancer.

Radon increases the risk of lung cancer
- Anyway, the health risks are close to my heart, because I worked as a doctor before I retired.

Radon, Rn, is an invisible, colorless and odorless radioactive gas present in the indoor air of buildings. It is considered to be the most significant cause of lung cancer indoors after smoking. As a result of radon, about 300 Finns get lung cancer every year.

Radon is especially present during the winter, when the indoor air is warmer than the air outside the house. The temperature difference causes a vacuum in the house, which absorbs radon from the soil into the indoor air along with other air.

- Radon increases the risk of lung cancer, but not other diseases. We don't smoke. If we got lung cancer, I think the reason would be clear: radon, Savola explains.

Markku Savola built his house with his family in 1986–1987, when there was little talk of radon. However, during the construction and design phase of the house, he studied radon maps in the area, which did not find any information about the elevated radon concentrations in the Ilomantsi area. The reason was the lack of measured values. Savolo's house is in the danger zone for radon, as it is located on a ridge landscape and on a slope. Radon is usually transported to the indoor air from the soil under and around the building. In coarse gravel, the currents become large and the coarse fillers promote the currents.

- The basement space on the slope side of the house is built in the ground. The soil is quite coarse gravel. The foundation is based on a foot and an earthen slab. The wall between the slope and the basement is concrete casting, Savola says.

Readings of Ilomantsi's highest
The Savolas made the first radon measurements as early as 1992, when the radon concentration rose to as much as 1,360 becquerels. After this, the seams of the bottom of the house were sealed as well as possible, as a result of which the radon concentration started to decrease, but not to a low enough level. Over the years, compaction work has continued, but concentrations have remained high.

Then in 2013, Savola made a decision on radon remediation, as the concentration in the ground floor rose alarmingly to over 2,000 Bq / m³. The readings were the highest in Ilomantsi if you compare them with other measurement results made during STUK's campaign. As a result, Savola participated in radon training organized by STUK and requested an offer from Uponor to carry out radon renovation. The contract was carried out by WP-Pipe, a HVAC company in Joensuu, which installed Uponor's radon system next to the slope-side wall. The system included plastic suction and transfer ducts, an exhaust fan installed in the fan well and a ventilation pile.

Quick and easy contract
The installation contract went quickly and easily in one working day. The work began with the excavation of a well of about three and a half meters. At the bottom of the well came crushed stone and a vacuum cleaner, from which came about a 15-meter drainage pipe.

An exhaust air fan built into the system creates a vacuum under the house, which absorbs radon gas into the suction duct and moves it out of the vicinity of the house in a controlled and safe manner along the exhaust duct.

- Previously, measurements were made over a two-month measurement period with equipment supplied by STUK. Just before and after the installation of the vacuum cleaner, the measurements were made with a Ramon 2.2 meter, which means that the measurement time was 2 days, Savola specifies.

- Uponor's radon removal system is a well-thought-out radon gas control solution. All installation accessories came with the radon renovation system, says Pekka Riikonen, CEO of WP-Pipe.

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