member of KORADO Group

Protection against radon

Heat recovery units VENTBOX

11/2024

What is RADON?

Radon is a naturally occurring invisible radioactive gas produced by the decay of uranium, thorium, and radium found in soil, rocks, and underground water. It is colorless, tasteless, and odorless, making it undetectable without special instruments.

Health risks associated with radon

Radon is the second leading cause of lung cancer after smoking. Inhaling it causes radioactive particles to settle in the lungs and damage lung tissue, which can eventually lead to cancer. Long-term exposure to high concentrations of radon can significantly increase the risk of the disease.

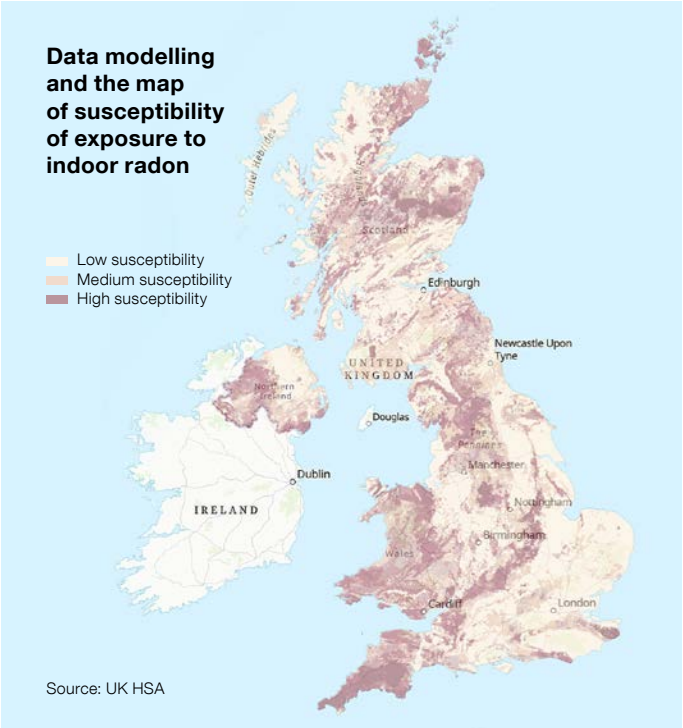
The World Health Organization (WHO) estimates that radon accounts for approximately 14% of lung cancer cases each year In Europe, radon contributes to approximately 20,000 deaths from this disease each year.

Safe Radon Concentration

Radon is measured in **becquerels per cubic meter** (Bq/m³). The World Health Organization recommends keeping radon concentrations below 100 Bq/m³, as the risk of health problems begins to increase above this threshold.

How does radon enter our homes?

Radon accumulates primarily in enclosed spaces such as homes, schools, kindergartens, and offices, where it can reach dangerous concentrations. Its presence indoors is hazardous in the long term, so it is important to measure radon concentrations in buildings and take measures to reduce its infiltration.



Cracks in walls and foundations
Radon often enters buildings through cracks and fissures in the foundation slab, walls, or floor. These areas then become the main entry points.

Gaps around pipes
Another risk area is the unsealed gaps around water, electricity, or sewage pipes that are not perfectly sealed and can lead to unwanted gas infiltration into living spaces.

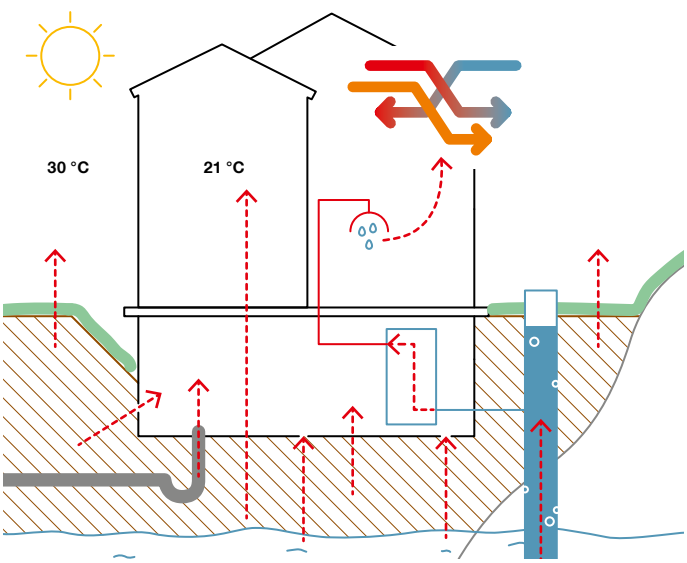
Building joints and seams
Joints between different parts of the building are another weak point, such as where the foundations meet the exterior walls.

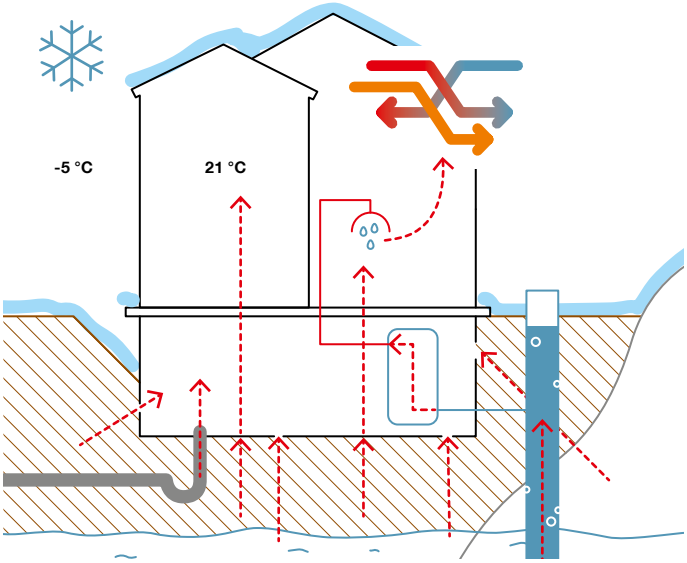
Covered spaces and basements
The underground parts of buildings are particularly susceptible to radon accumulation, as they are in direct contact with the soil where radon is naturally released, and there is a higher risk of its concentration.

Groundwater
In some areas, radon is also found in water, especially in water drawn from deep wells. Using such water releases radon into the air, contributing to increased concentration.

Building materials
These are materials commonly used in older residential construction, where building materials with higher uranium content, particularly radium, were often found. This increased content can be of natural origin (e.g., granite) or technological origin (e.g., slag, fly ash).

Radon ventilation using controlled ventilation





The penetration and flow of radon change throughout the year due to external factors such as snow, ice, wind, rain, or temperature. Therefore, we can measure different radon levels in different seasons. The greatest influence on radon intake is the so-called chimney effect, where the building actively draws radon from the ground. This effect intensifies with the increasing difference between indoor and outdoor temperatures, leading to an increase in the negative pressure inside the building.

Increased radon concentration

Increased concentrations of radon and carbon dioxide (CO_2) in a classroom or workplace can have several negative consequences for people's health and well-being.

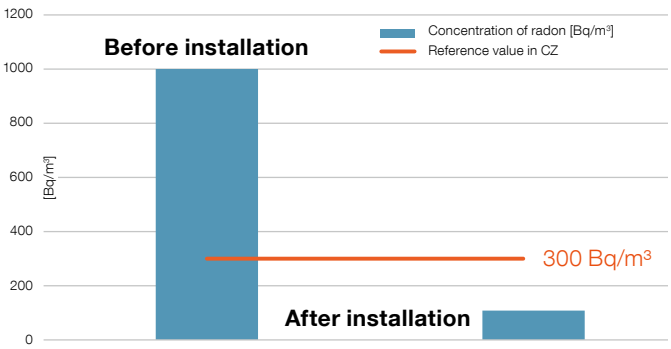
Health risks

Inhaling radon particles can lead to lung tissue damage and increase the likelihood of developing respiratory diseases or lung cancer.

Mental and physical health

High levels of radon can cause anxiety and stress due to health concerns, which can affect overall well-being and productivity.

Example of radon concentration measurement in an apartment in Czech Republic before and after the installation of VENTBOX heat recovery ventilation units.



The measurement was conducted by a certified expert, and the results were independently verified by SÚRO (National Radiation Protection Institute).

When radon concentrations are elevated, it is important to take measures to reduce them and ensure a healthy indoor environment.

Improving Ventilation

- **Natural ventilation** – ensures that spaces are well-ventilated. Opening windows and ensuring air flow can help reduce radon concentration.
- **Mechanical Ventilation** – installing heat recovery systems and fans can help exchange CO_2-laden air in rooms and reduce radon levels.

Radon and VENTBOX ventilation units

- Heat recovery units VENTBOX are an effective solution for ensuring a healthy environment in homes and workplaces. These units can be equipped with a radon sensor that automatically monitors the indoor radon concentration.
- Thanks to this technology, the unit can respond promptly and continuously to potential dangers associated with elevated radon levels. It automatically adjusts its ventilation mode, thereby reducing the risk of radon accumulation in enclosed spaces.
- VENTBOX systems contribute to better air quality and the protection of residents' health in every season, ensuring a safe and comfortable environment. These systems allow for effective ventilation without the need to open windows and lose valuable heat from the interior. VENTBOX thus enables efficient energy consumption control, monitoring heating costs, and ensuring economical operation.

How to manage radon and maintain healthy air without moisture and impurities?

Central heat recovery units are key elements of modern living and working environments. This innovative technology provides efficient ventilation while minimizing energy losses. These units offer the possibility of installing a radon sensor, which is particularly relevant in high radon concentrations. This innovative feature allows for continuous monitoring, providing users with an accurate overview of the levels of this radioactive gas in their living environment.

CENTRALISED HEAT RECOVERY UNITS

* at 30 m³/h

VENTBOX 150 Thin

For apartments and small houses up to 100 m²

- 192 × 593 × 1 248 mm (h × w × d)
- Optimum, Premium versions
- possibility of fitting with an enthalpic counterflow heat exchanger
- M5 ePM10 filters or F7 ePM1

* at 50 m³/h

VENTBOX 300

For apartments and small houses up to 200 m²

- 750 × 790 × 625 mm (h × w × d)
- Optimum, Premium versions
- possibility of fitting with an enthalpic counterflow heat exchanger
- M5 ePM10, F7 filters or F7 carbon filters ePM1

* at 50 m³/h

VENTBOX 400

For family houses up to 300 m²

- 750 × 790 × 625 mm (h × w × d)
- Optimum, Premium, Comfort versions
- possibility of fitting with an enthalpic counterflow heat exchanger
- M5 ePM10, F7 filters or F7 carbon filters

Cooling option

Reheating option

* at 60 m³/h

VENTBOX 800

For family houses with an indoor pool, administrative buildings, schools, kindergartens, cafes up to 600 m²

- 1 270 × 1 005 × 750 mm (h × w × d)
- Premium versions
- possibility of fitting with an enthalpic counterflow heat exchanger
- M5 ePM10 filters or F7 ePM1

DECENTRALISED HEAT RECOVERY UNITS

* at 60 m³/h

VENTBOX 800 Public

For schools, kindergartens, halls, training centers, libraries and offices up to 600 m²

- 2050 × 1005 × 740 mm (h × w × d)
- Premium versions
- possibility of fitting with an enthalpic counterflow heat exchanger
- F7 filters or F7 carbon EPM1 filters

If you need more information about radon issues and possible solutions, do not hesitate to contact our company.

We will be happy to provide you with the necessary information about our products and ways to effectively monitor and regulate radon.

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