



# European Radon Solutions Database

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## Existing Buildings

### Case Study

Sheet N°

CZ/CS/06

### Type

**POSITIVE PRESSURIZATION**

### Country

Czech Republic

## Illustration



Front view of the basement flat. On the left side of the kitchen window there is an inlet for the ventilation unit and on the right side of the window there is an outlet from the cooker hood.



Ventilation unit above the kitchen window with the heater for preheating of the outdoor air on the right side. On the left side the distribution pipe continues through the partition wall to the living room. The rectangular pipe above the unit is an exhaust pipe from the cooker hood.



Casing of pipes made of gypsum plasterboard. An outlet into the kitchen will be provided with air diffuser.

## Description

Radon remedial measure was installed into a basement flat inside a five-storey villa, which was built in 1936. The external dimensions of the flat are 11,0 x 5,5 m. Brick and stone bearing walls have the thickness from 300 to 700 mm. The flat consists of three adjacent habitable rooms: kitchen, living room and bedroom. In the bedroom and in the living room are timber floors placed directly on the soil, in other rooms the floors are made of in-situ concrete.

Increased ventilation was ensured by means of a ventilation unit Doctor Flat (Flatmaster 5+), which was installed in the kitchen above the window. On the ventilating duct between the inlet and the unit the heater is placed for preheating of the supply air in cold seasons. The air is supplied from the unit into all habitable rooms. In each room the diffuser is installed on the ventilating duct to regulate the volume of air discharged into it.

## Selection

This form of mitigation was chosen, because it causes the smallest obstructions in the living space. The owners did not accept the reconstruction of floors. Soil ventilation installed from the interior could be hardly realised without at least partial destruction of some floors. Soil ventilation installed from the exterior would be very labour consuming and costly, because the floors are approximately 1 m below adjacent terrain.

## Pre-installation Diagnosis

Parameters of the soil around the house:

Third quartile of radon concentration in the soil gas (obtained from 15 measurements around the house from the depth 0,8 m)	170 kBq/m <sup>3</sup>
Mean permeability of the soil around the house	high
Radon risk category of foundation soils	high

## Radon reduction achieved

Radon concentration before remediation has been measured by track detectors with the exposition time of one year. Radon concentration after remediation has been measured by one-week measurements.

Room	Radon concentration (Bq/m <sup>3</sup> )		Effectiveness (%)
	Before remediation	After remediation	
Kitchen	956	174	82
Living room	1016	192	81
Bedroom	880	125	86

Radon concentration has decreased in all rooms below the action level 400 Bq/m<sup>3</sup>. The effectiveness of the system varies in different rooms between 81 and 86 %, which means that indoor concentration decreases to 19 % up to 14 % of the initial values.

## **Problems**

No problems occurred during installation.

## **System enhancements**

To minimise heat losses the ventilation unit is switched to intermittent operation. Operating periods are adjusted according to continuous measurements of indoor radon concentration.

## **Further Information**

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