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COMPARISON OF RADON BARRIER PROPERTIES OF HEATLOK HFO FOAM INSULATION WITH PE MEMBRANE

Radon diffusion coefficient D is a material constant that shows the ability of radon to diffuse in the material. The radon diffusion coefficient alone cannot demonstrate the real barrier properties of a particular waterproofing product.

The ability of a material to form an efficient barrier against radon diffusion is expressed by the **radon resistance R_{Rn}** that is defined according to the following equation.

$$R_{Rn} = \frac{\sinh d/l}{\lambda \cdot l} \quad [\text{s/m}]$$

where d is the thickness of the material [m], λ is the radon decay constant [$2,1 \cdot 10^{-6} \text{ s}^{-1}$] and l is the radon diffusion length in the material [m]. Radon resistance must be always stated together with the thickness of the material. Greater value of the radon resistance means better barrier properties.

Comparison of tested materials

Sample	d [mm]	D [m^2/s]	R_{Rn} [s/m]	R_H/R_{PE} [-]
PE (CAN-CGSB-51.34-M)	0,15	$7,2 \cdot 10^{-12}$	$21 \cdot 10^6$	-
Heatlok [®] HFO	15	$1,3 \cdot 10^{-10}$	$199 \cdot 10^6$	9,5
	20		$382 \cdot 10^6$	18,2
	25		$725 \cdot 10^6$	34,5
	30		$1\,370 \cdot 10^6$	65,2
	50		$17\,410 \cdot 10^6$	829,0

Legend: R_H – radon resistance of Heatlok[®] HFO foam insulation, R_{PE} – radon resistance of PE

As can be seen from the Table, the barrier properties of Heatlok[®] HFO foam insulation of specified thicknesses are at least 9,5 times better than those of PE membrane of the thickness of 0,15 mm.

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