TESTING OF UNDERSEAL® MEMBRANES AS A BARRIER TO RADIOACTIVE RADON GAS

Testing of Underseal for air permeability and radioactive radon gas diffusion was performed at a major American university. Results when tested against uncracked and unjointed concrete showed a one order of magnitude reduction in radon permeability, and a two order of magnitude reduction in radioactive radon diffusion.

Radioactive Radon Permeability and Diffusion Testing

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The following permeability and diffusion coefficients were determined for Polyguard Underseal® Membranes:

Table 1. Measured air permeability coefficient.

Material	Pressure Difference (Pa)	Average Permeability (m2)
Concrete Sample	20	3.06 x 10-15
Membrane	20	2.99 x 10-18
Concrete/Membrane	20	1.95 x 10-15

Table 2. Measured radon gas diffusion coefficient.

Material	Average Diffusion Coefficient (cm2/s)
Concrete Sample	1.63 x 10-3
Membrane	6.69 x 10-5
Concrete/Membrane	4.72 x 10-5

In summary, the tested membrane exhibited a very small permeability coefficient compared to the concrete sample. By placing the membrane adjacent to the concrete sample, a 36.2% reduction in the permeability coefficient as compared to the plain concrete sample was realized. With regards to the diffusion tests, measurements showed the membrane exhibited a two order of magnitude difference with the concrete sample. By placing the membrane adjacent to the concrete sample, a 97.1% reduction in the radon gas diffusion coefficient was realized as compared to the plain concrete sample.

For details on the testing contact Polyguard Products.