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FACULTY OF CIVIL ENGINEERING – TEST LABORATORY
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Order No: 8601869A000

TEST REPORT No: 124057/2018

upon the test : **Radon diffusion coefficient of the SISALEX 871 8my membrane carried out in accordance with the K124/02/95 method**

Client:

Ampack AG
Seebleichestrasse 50
CH-9404 Rorschacherberg
Switzerland

Date of issue: 4.12.2018

Approved by:

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Prof. Ing. Martin Jiránek, CSc.
head of OL 124 laboratory

The measurement of the radon diffusion coefficient of the Sisalex 871 8my – a scrim reinforced membrane comprising Aluminium and double polymers layers, was performed in accordance with the requirements for determining the radon diffusion coefficient stated in the K124/02/95 test method. The test was carried out during the period from 5.4.2018 to 24.4.2018.

Test samples

Test samples were cut from the material handed by the client (Juho Hyytiäinen) on 23.3.2018. The samples were registered with marks 18/18/J (1 to 9) by M. Jiránek. The test samples were 160 mm and 200 mm in diameter and their thickness was 0,31 mm. Two types of overlap were tested. The Al overlap, where two Al layers are jointed inside the membrane and the BK + XT overlap, where two sheets of the membrane are sealed with two 15 mm wide self-adhesive tapes placed between the sheets and a 60 mm wide tape applied over the joint.

Test method

Radon diffusion coefficient was measured according to the accredited method K124/02/95 (method C of ISO/TS 11665-13). The tested sample is placed between two containers. Radon diffuses from the lower container, which is connected to the radon source, through the sample to the upper container. When the steady state concentration profile within the sample is reached, the growth of radon concentration in the upper container is measured. From the known time dependent curve of the radon concentration increase in the upper container the radon diffusion coefficient can be calculated. The test method was approved by the State Office for Nuclear Safety on 6.8.1998.

Laboratory conditions

Sisalex 871 8my – material
Steady state radon concentration in the lower container: 48,8 ± 0,3 MBq/m^3
Radon supply rate into the upper container: 0,4 ± 0,1 Bq/m^{3}s

Sisalex 871 8my – Al overlap
Steady state radon concentration in the lower container: 49,4 ± 0,3 MBq/m^3
Radon supply rate into the upper container: 0,3 ± 0,1 Bq/m^{3}s

Sisalex 871 8my – BK + XT overlap
Steady state radon concentration in the lower container: 35,4 ± 0,2 MBq/m^3
Radon supply rate into the upper container: 10,5 ± 0,3 Bq/m^{3}s

Measuring device: radon monitor RDA 200 (N12), micrometer (N11)
Laboratory temperature: 20°C ± 2°C
Relative humidity of air in the laboratory: 38% ± 4%
Pressure difference between the lower and the upper containers: 0 Pa

Test results

The results of performed tests are compiled in the following table:

TESTED MATERIAL	RADON DIFFUSION COEFFICIENT D (m^2/s)	
	mean value	uncertainty
Sisalex 871 8my	$1{,}4.10^{-13}$	$\pm 0{,}1.10^{-13}$
Sisalex 871 8my, Al overlap	$1{,}0.10^{-13}$	$\pm 0{,}1.10^{-13}$
Sisalex 871 8my, BK+XT overlap	$5{,}3.10^{-12}$	$\pm 0{,}5.10^{-12}$

The stated uncertainty of the measurement is the uncertainty with the coefficient k = 2, which for the normal distribution corresponds to the probability of coverage approx. 95 %.

Recommendation

Applicability of the tested material for a radon-proof product can be in a particular case considered in accordance with national building codes or standards.

The test was performed by: Prof. Ing. Martin Jiránek, CSc.
The report was prepared by: Prof. Ing. Martin Jiránek, CSc.

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test specialist

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end of the report