REPORT

Issued by an Accredited Testing Laboratory

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Date	Reference	Page
2025-12-12	1334275	1 (2)

Dana Lim A/S
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Determination of radon transmittance

(2 appendices)

Work requested

RISE was requested to measure the radon transmittance through a membrane in accordance with SP Method no. 3873.

The material sample

The client delivered their product which is named Fugemastic 544 or Da Mastic 551 applied on a standard paper coated gypsum board to RISE Research Institute of Sweden on 2025-09-16. A standard paper coated gypsum board is totally permeable to radon gas. There were no signs of visible damage to the material on arrival. The client states that the thickness of the membrane is close to 8 mm. The material was tested without joints. See Appendix 2 for a picture of the material.

Method of testing

Radon transmittance was tested in accordance with SP Method no. 3873. The material was mounted between two stainless steel boxes, the lower of which (the source box) contained a radon source. The perimeter was sealed very carefully, in order to ensure gas-tight joints between the boxes and the material, and also between the boxes themselves. The radon concentrations on each side of the test material was measured using an Atmos 33 instrument.

Results

Material	Radon transmittance P, m/s	Radon resistance Z, s/m
Fugemastic 544 Da Mastic 551	$< 3.0 \cdot 10^{-9}$	$> 3.3 \cdot 10^{8}$

Note that the test results shown above apply only to the particular sample of material that was tested. Detailed results, including uncertainty of measurement, are given in Appendix 1.

Also note that the SP Method no. 3873 cannot state values of radon transmittance that are lower than $3.0 \cdot 10^{-9}$ m/s as results lower than this can be affected by the normal level of radon gas indoors. In the same manner, the method cannot state values of the radon resistance above $3.3 \cdot 10^{8}$ s/m.

RISE Research Institutes of Sweden AB
Building physics & sustainable buildings - Building physics testing

Performed by

Fredrik Ståhl

Examined by

Eva-Lotta Kurkinen

Appendices

1 Test results

2 Photographs of the tested material

Appendix 1

Test results

Client	Dana Lim A/S
Sample for testing	The product is sold under two different names: Fugemastic 544 or Da Mastic 551
Date of testing	2025-11-27 – 2025-12-04
Test data	Free volume, source box, V_1: 0.027 m^3 Free volume receiver box, V_2: 0.026 m^3 Total free volume, V: 0.053 m^3
Equipment	Atmos 12 DPX (KWP18569) for measurement of Polonium-218 concentration. Most recently calibrated 2025-11-06 by Swedish Radiation Safety Authority.
Radon source	Lightweight concrete emitting Radium Rn-222, with Po-218 as the first decay product.
Ambient temperature	23 ± 3 °C
Ambient RH	50 ± 25 %
Uncertainty of measurement	The increased uncertainty of measurement was estimated as ± 11 %, including a coverage factor of k = 2. Uncertainty of measurement for temperature was ± 2 °C, and that for relative humidity was ± 5 % in the test chamber.
Observation	No changes in the test material were observed during the tests.
Miscellaneous	The test results given in this report relate only to the particular samples of material that were tested.

The following results have been calculated under the conditions as shown in the table below:

Material, name	Fugemastic 544 / Da Mastic 551
Exposed area of test material A, m^2	0.250
Radon concentration at start C_0, Bq/m	31
Radon exhalation Φ, Bq/s	$5.6 \cdot 10^{-3}$
Effective radon sink λ, s^{-1}	$1.2 \cdot 10^{-6}$
Radon transmittance P, m/s	$< 3.0 \cdot 10^{-9}$
Radon resistance Z, s/m	$> 3.3 \cdot 10^{8}$

Appendix 1

Theory

Emission of radon from the radon source results in an increase of radon concentration in the source box, leading to a difference in concentration between the source box and the receiver box. This difference causes a flow of radon by diffusion through the test material. Only radon gas (Rn) passes through, and not its decay products (RnD). Radon transmittance is measured by measuring the change in radon concentration on both sides of the test material. Figures 1 and 2 show how the radon concentrations build up in the two boxes.

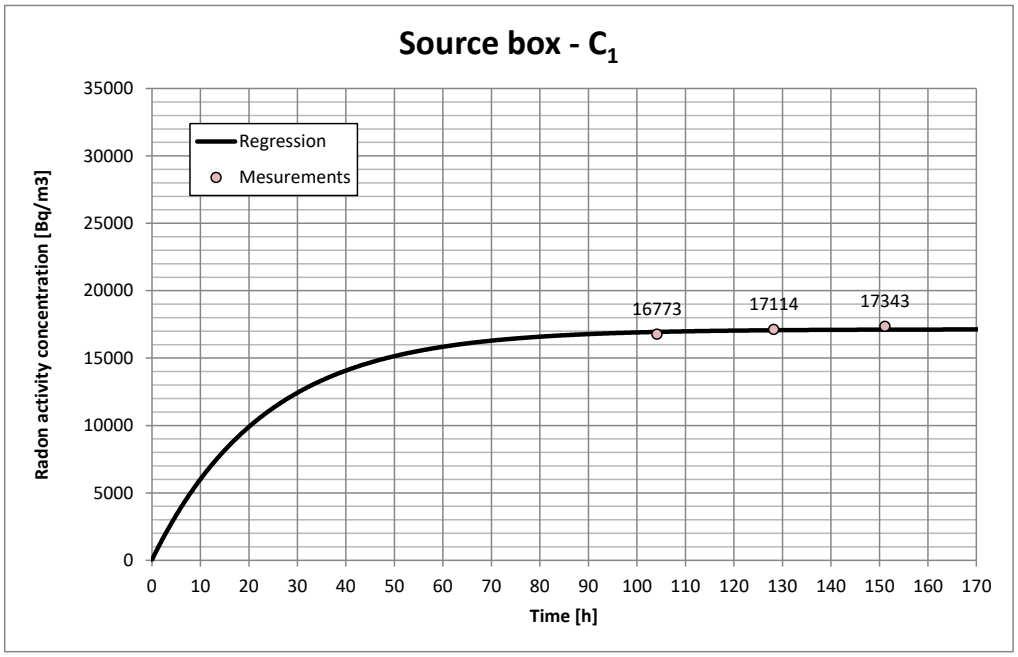


Figure 1 Radon concentration in the primary box: measured daily average values and the regression curve.

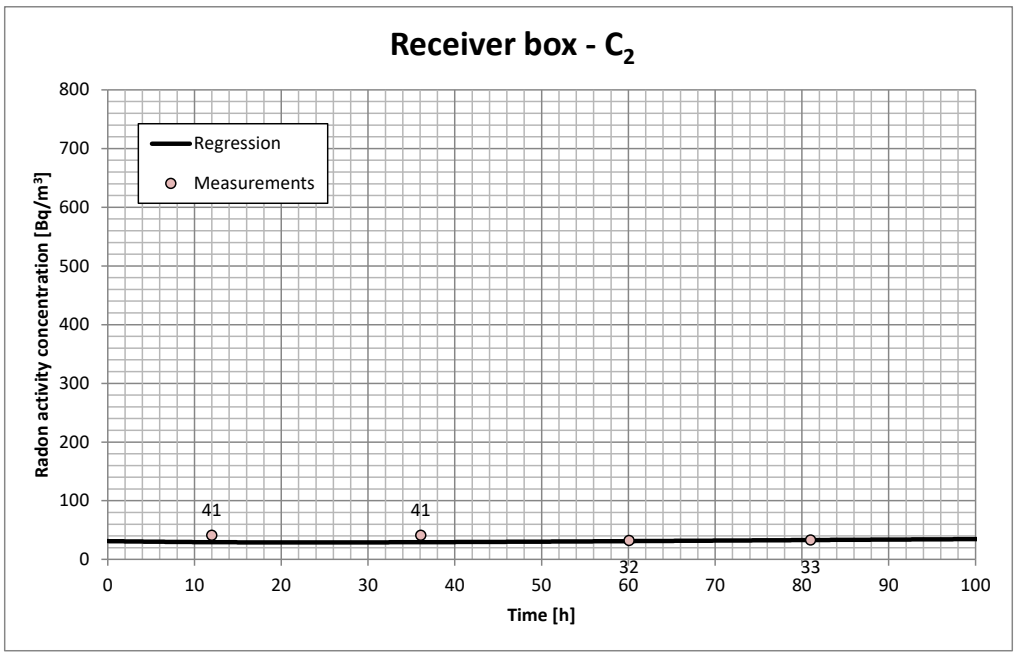
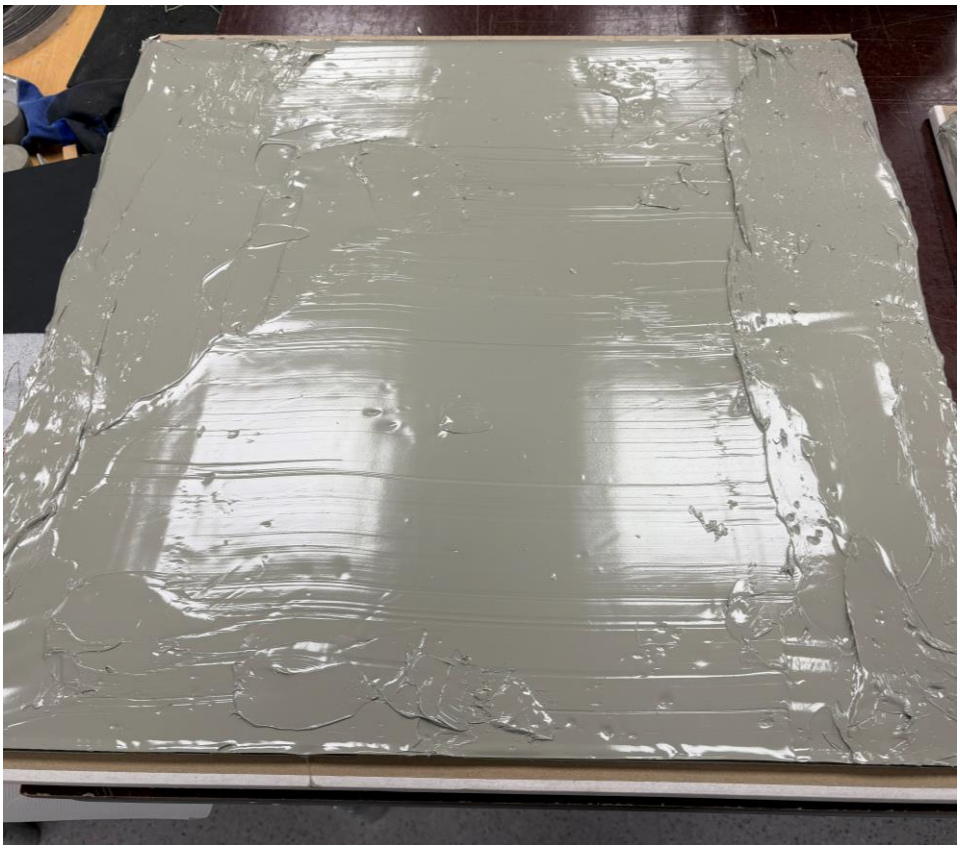


Figure 2 Radon concentration in the secondary box: measured daily average values and the regression curve.

Appendix 2

Photographs of the tested material



Fugemastic 544 / Da Mastic 551

Verifikat

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