

Measurement report

Air Permeability of “SMARTPLY AIRTIGHT” OSB panels

Company: MEDITE SMARTPLY
Belview Slieverue
Waterford, Ireland

Product: OSB panel “SMARTPLY AIRTIGHT” (12.5 mm)

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Passive House Institute
Dr. Wolfgang Feist
Rheinstraße 44/46
D-64291 Darmstadt
www.passiv.de

Author: Søren Peper

1. Preface

To meet a very low heating demand, Passive Houses take advantage of upgrading existing components in a building to a very high quality, effectively doing away with the need for a separate, potentially expensive, inconvenient or unnecessary heating system. A very airtight building envelope is an indispensable part of any Passive House.

To this end, the Passive House Institute has defined requirements and test criteria for the air permeability permissible for products that are suitable for Passive House-construction.

2. Reason for the study

For the certification of the airtightness of OSB panels, the Passive House Institute has determined the permeability of SMARTPLY AIRTIGHT panels for MEDITE SMARTPLY.

3. Measurement

The samples (2397 mm x 1197 mm, nominal thickness 12.5 mm) were delivered from the manufacturer to the Passive House Institute some months before the test.

Two OSB panels were tested (each 600 mm x 1600 mm), joined with tape as specified by the manufacturer (Isocell “Airstop flex”, 60 mm width). The tape was applied without a primer. In the test facility, the panels were assembled together, without a gap or spacer. For the purpose of comparison, a single OSB panel (1200 mm x 1600 mm) was also tested.

The test facility had a free area of 1560 mm x 1110 mm = 1.732 m². The test facility is located at IsoChemie in Aalen, Germany.

The panels were tested with positive and negative pressures as follows [Pa]: 50, 100, 150, 200, 250, 300, 450, 600. The test was carried out according to the standard DIN EN 12114:2000-04. In addition, the panels were tested at 2000 Pa for short periods (deflection).

For all samples, two series of tests comprising positive and negative pressure were carried out. The first series was undertaken with an airtight membrane covering the panel, to prevent any air permeation and enable a reference measurement of the air tightness of the testing facility itself.

4. Images of the test

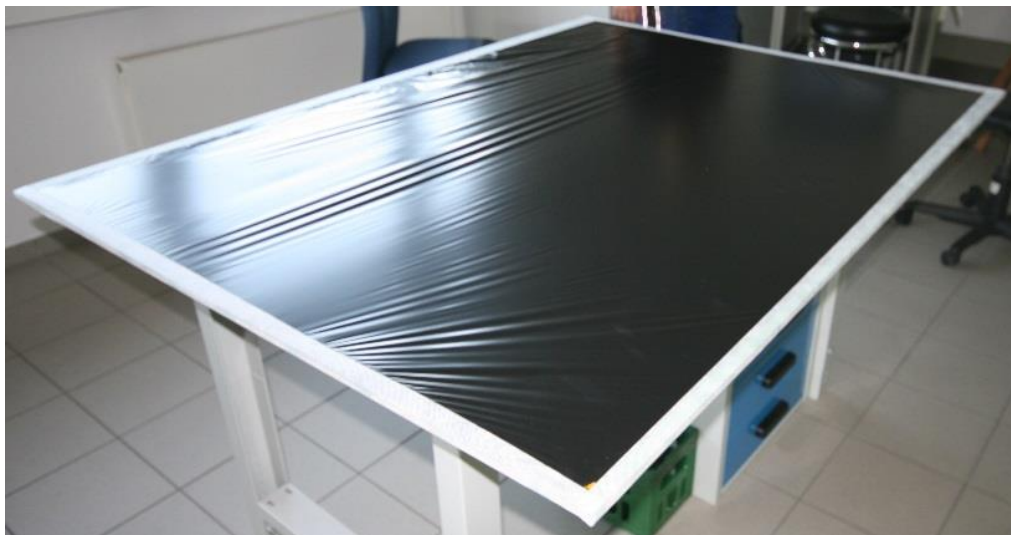


Image 1: OSB panel with membrane, sealed with tape at the edges for the reference measurement



Image 2: Two adjacent OSB panels, joined with tape in the test facility and covered with the membrane to enable measurement of the air tightness of the test facility



Image 3: Two adjacent OSB panels, joined with tape in the test facility



Picture 4: Deformation of the panel @ 2000 Pa, deflection of about 2 cm at a span of 1600 mm. The second panel in the front is used as a reference to measure the deflection.

5. Measurement results

Day of test: 2016.02.21

Table 1: Measurement results of the air permeability test

pressure [Pa]	50	100	150	200	250	300	450	600
sample #1: Two OSB panels with tape								
average pressurization/ depressurization air flow [m ³ /h]	0.06	0.06	0.09	0.12	0.15	0.18	0.24	0.32
average pressurization/ depressurization air flow test facility [m ³ /h]	0.04	0.08	0.10	0.14	0.16	0.19	0.27	0.35
Difference *) [m ³ /h]	0.02	-0.02	-0.01	-0.02	-0.01	-0.01	-0.03	-0.03
Area panel [m ²]	1.73							
q ₅₀ average pressurization/ depressurization *) [m ³ /(h m ²)]	0.01	-0.01	-0.01	-0.01	0.01	-0.01	-0.02	-0.02

sample #2: Two OSB panels with tape								
average pressurization/ depressurization [m ³ /h]	0.05	0.07	0.09	0.12	0.15	0.18	0.27	0.34
average pressurization/ depressurization test facility [m ³ /h]	0.04	0.06	0.08	0.10	0.14	0.17	0.27	0.36
Difference *) [m ³ /h]	0.01	0.01	0.01	0.02	0.01	0.01	0.00	-0.02
Area panel [m ²]	1.73							
q ₅₀ average pressurization/ depressurization *) [m ³ /(h m ²)]	0.01	0.01	0.01	0.01	0.01	0.01	0.00	-0.01

sample #3: One OSB panel								
average pressurization/ depressurization [m ³ /h]	0.05	0.07	0.11	0.14	0.18	0.24	0.34	0.45
average pressurization/ depressurization test facility [m ³ /h]	0.04	0.08	0.12	0.14	0.17	0.20	0.31	0.38
Difference *) [m ³ /h]	0.01	-0.01	-0.01	0.00	0.01	0.04	0.03	0.07
Area panel [m ²]	1.73							
q ₅₀ average pressurization/ depressurization *) [m ³ /(h m ²)]	0.00	-0.01	-0.01	0.00	0.01	0.02	0.02	0.04

*) The values listed arise from differences with measuring accuracies in the range of ± 0.04 m³/h and can therefore also take slightly negative values.

6. Measurement conditions

On the day of the test, the conditions in the testing room were as follows:

Room air temperature: 20,6 to 21,2 °C
Room air relative humidity: 48,4 to 51,5 %

7. Connections

Panels were joined with specialist airtightness tape as specified by the manufacturer, as follows:

- a) Between panels: Isocell “Airstop flex”
- b) Between panels and other wood components: Isocell “Airstop flex”
- c) Between panels and plaster: See extra document “SMARTPLY AIRTIGHT - Airtightness Installation Manual”

8. Results

The investigation shows that the air permeability of the panels is very low. The results are even lower than the measurement accuracy of about $\pm 0,04 \text{ m}^3/(\text{hm}^2)$.

Table 2: Main Results

		Average flow at 50 Pa [m ³ /(hm ²)]
sample #1	Two panels with tape	0,00 ($\pm 0,04$)
sample #2	Two panels with tape	0,02 ($\pm 0,04$)
sample #3	One panel	-0,01 ($\pm 0,04$)

There is no apparent variation between the permeability of one panel and two panels joined together with tape.

The average from sample #1 and sample #2 (panels with tape) at 50 Pa:

$$q_{50} = 0,01 (\pm 0,04) \text{ m}^3/(\text{hm}^2)$$

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Passive House Institute

Dipl.-Ing. (FH) Søren Peper