

Evidence of Performance

Air permeability of building elements

Test Report

No.16-003669-PR01

(PB-A01-02-en-01)



Client NIDA Sp. z o.o. Sp. K.
Sikorskiego 38
58-160 Swiebodzice
Poland

Product/Building element	frame extensions
Designation	NVG02 (P)
Overall dimensions (w x h)	1,100 mm x 1,100 mm
Material	PVC-U
Installation situation General requirements	The frame extensions composed of 33 typical components Overall dimensions: 1,100 mm x 1,100 mm Joint length: 32,180 mm

Result

Air permeability

$$Q_{10} = 0.002 \text{ m}^3/(\text{h m})$$

$$Q_{100} = 0.02 \text{ m}^3/(\text{h m})$$

Airflow coefficient C
 $0.00014 \text{ m}^3/(\text{h Pa}^n)$

Leakage exponent n
1.12



Basis

EN 12114:2000-03
Correspond to national version
(e.g. DIN EN)

Representation



Instructions for use

This test report serves to demonstrate the air permeability of the joints of a cleanroom ceiling element

Validity

The data and results given related solely to the tested and described specimen in Clause 2.

Transfer of test results

The measured results were obtained from the product in new state. The effects of weathering and ageing were not taken into account.

Notes on publication

The ift Guidance Sheet "Conditions and Guidance for the use of ift Test Documents" applies.

The cover sheet cannot be used as an abstract.

ift Rosenheim

07.04.2017

Thomas Stefan, Dipl.-Ing. (FH)
Head of Testing Department
Building Component Testing

Stephan Bertagnolli, Dipl.-Ing. (FH)
Operating Testing Officer
Building Component Testing

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1 Order

The company NIDA Sp. z o.o. Sp. K., 58-160 Swiebodzice (Poland), commissioned the **ift** Rosenheim, to test the air permeability of the specimen described below. The cross section of the specimen is given in Fig. 3.

2 Description of test specimen

33 Frame extensions were incorporated into an airtight test apparatus with 2 tube connections for pressure and air flow measurement. The frame extensions were factory installed by the client. The joints between the frame extensions and test apparatus were sealed using resilient sealant.

Element layout: frame extensions

Overall dimensions: 1,100 mm x 1,100 mm

Further details are given in drawings and photos.

2.1 Representation of test specimen and test configuration

Verification of structural details was based solely on the characteristics to be tested.

The photographs were taken at the **ift** during and after the test.

Drawings are based on unchanged documentation supplied by the client.



Photo 1 Frame extensions

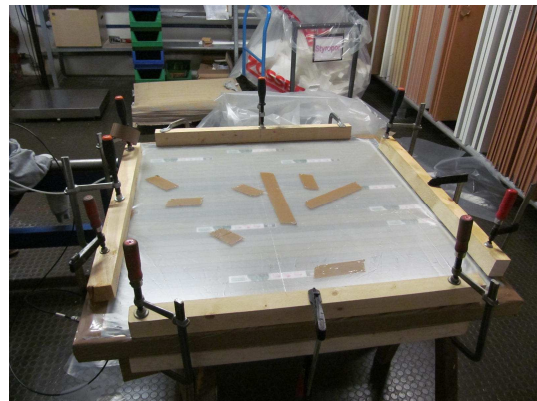


Photo 2 Frame extensions taped for zero-measurement

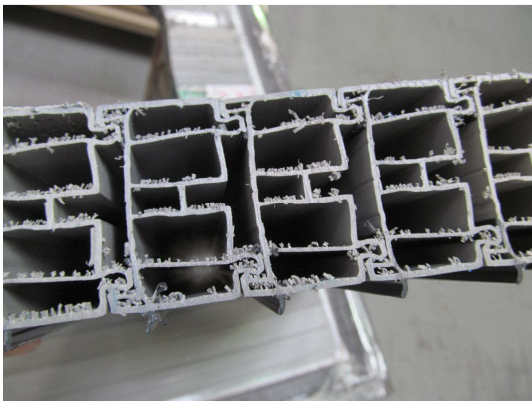
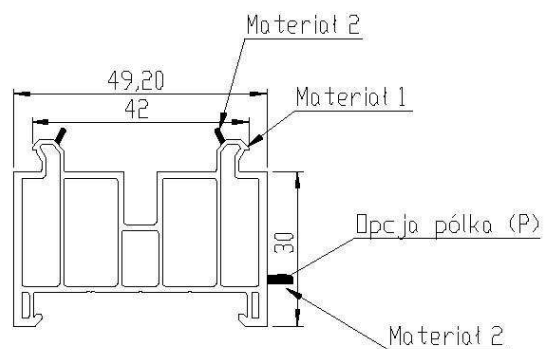



Photo 3 section of frame extensions



	IMIĘ I NAZWISKO	DATA	PODPIS		TYTUŁ	
NARYS.	D. Neumann	2015-10-28			Listwa transportowo - montażowa NVG 02 P	
SPRAWDZ.						
Zmiana 1						
Zmiana 2						
Zmiana 3				MATERIAŁ: Materiał 1 - PVC - U Materiał 2 - PVC - P	NR RYSUNKU 2015-10-28 NVG 02 P	A4
Wymiary netto: m.g. 2768m				WAGA	SKALA	ARKUSZ 1 Z 1
Uwagi						

Drawing 1 Test specimen

3 Procedure

The test was based on

DIN EN 12114 : 2000-03 Air permeability of building elements – Laboratory test.

The specimen is tested for air permeability according to DIN EN 12114 at positive test pressures in steps up to a maximum test pressure differential of 1,000 Pa (Fig. 7).

Pressure differentials at positive pressure (measuring range) in Pascal:

50, 73, 106, 154, 224, 325, 473, 688, 1,000

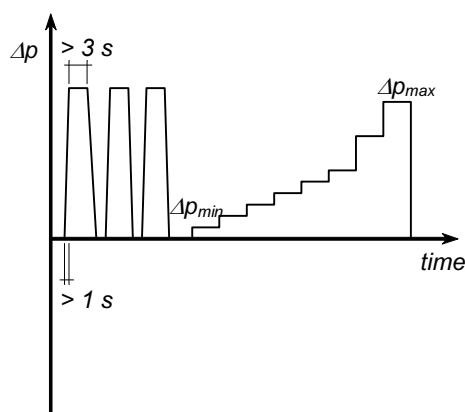


Fig. 2 Test of air permeability at positive pressures

The test apparatus meets the before-mentioned standard.

Tests were performed at a room temperature of $20\text{ °C} \pm 3\text{ °C}$.

Flowmeter	Rotameter, measurement range 60 - 600 l/h instrument No.: 20124
	Rotameter, measurement range 500 - 5000 l/h Device No.: 20125
	Rotameter, measurement range 8 - 100 l/h Device No.: 22458
Measuring device	Differential pressure meter testo 510 Device No.: 20827
Date/period	28.03.2017
Test engineer	Dipl. Ing. (FH) Stephan Bertagnolli, Franz Gruber

4 Results

The test was performed at positive pressure in the test apparatus up to a maximum test pressure differential of 1000 Pa.

The measured values given in the following were obtained from determining the difference between zero measurement with taped joints of the ceiling panels and measurement with opened joints.

4.1 Results obtained from positive pressure in the test apparatus

Joint length: 32,180 mm

Table 1 Measured values at positive pressure in test apparatus

Pressure differential Pa	50	73	106	154	224	325	473	688	1000
Measured values in m ³ /h	0,01	0,02	0,03	0,04	0,07	0,09	0,13	0,21	0,31
V ₀ in m ³ /h ^{*)}	0,01	0,01	0,03	0,04	0,07	0,09	0,13	0,20	0,30
V ₀ in m ³ /hm ^{*)}	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01

^{*)} V₀: corrected air flow rate under reference conditions (20 °C / 50 % rel. LF / 101325 Pa air pressure)

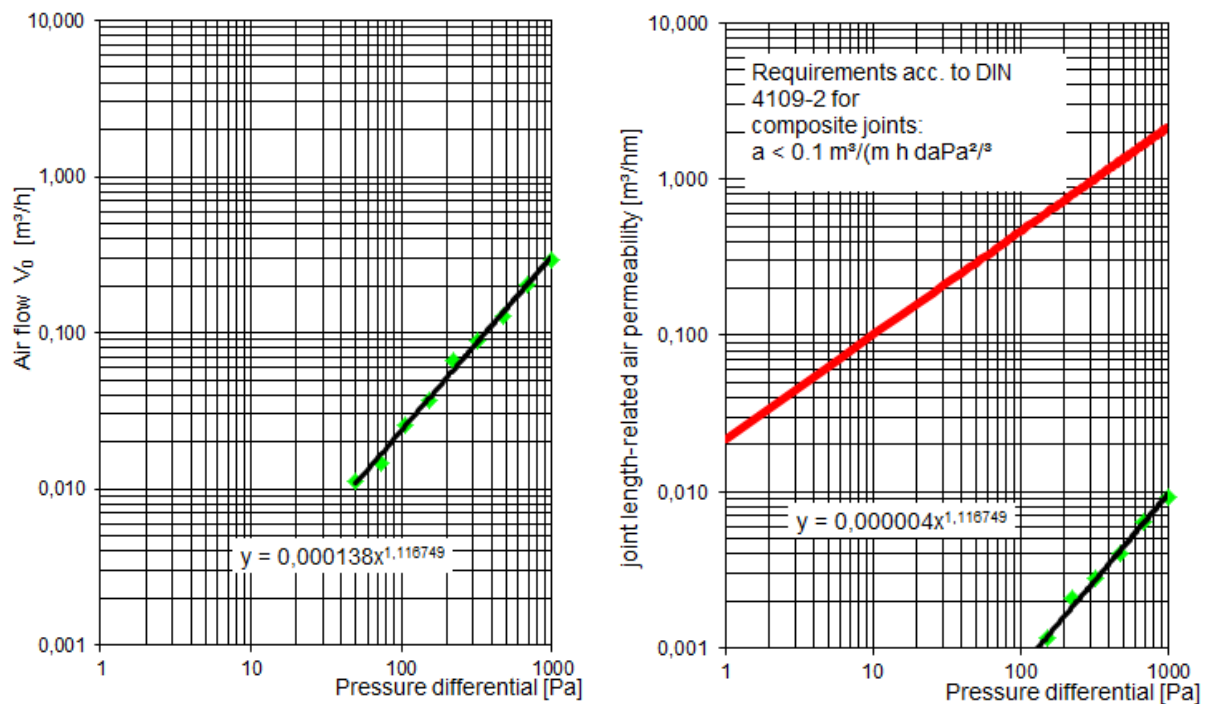


Diagram 1 Air permeability in m³/h at positive pressure in test apparatus

Table 2 Evaluation

Parameters	Results		
	Value	95% Confidence range	Unit
Airflow coefficient C ¹⁾²⁾	0.00014	± 0.00004	m ³ /(h Pa ⁿ)
Leakage exponent n ²⁾	1.12	± 0.06	--
¹⁾ Air flow rate through test specimen at a pressure differential of 1 Pa			
²⁾ C and n after empirical air flow equations $V = C \times \Delta p^n$			
Reference air permeability related to joint length at 10 Pa Q ₁₀	0.002 m ³ /(h m)		
Reference air permeability related to joint length at 100 Pa Q ₁₀₀	0.02 m ³ /(h m)		