

Certificate ***of the Airtightness Test***

Object:

end-terrace house

**Musterstrasse 123
54321 Passivhausen**

Test Date: 01.05.2017

Select

according to EN 13829, Method A

12.05.2017

Passivman

Passivhaus Institut Dr. W. Feist
Rheinstraße 44/46
64283 Darmstadt

Blower Door Test report

Content

Building info	Page 1
Test data	Page 2
Air leakage graph	Annex A
Comments	Annex B
Zero flow (baseline) and accuracy	Annex C

BlowerDoor Test

EN 13829, Method A

Building Test Info and Test Equipment

Building Information

Building:	end-terrace house
Address:	Musterstrasse 123 54321 Passivhausen Year of Construction: 2017 Test Date: 01.05.2017

Customer Information

Name:	
Address:	Frankfurter Straße 149 63263 Neu-Isenburg
Phone:	06102-8129121
Fax:	06102-8129130

Business Info

Name: Passivhaus Institut Dr. W. Feist	Technician: Passivman
Address: Rheinstraße 44/46 64283 Darmstadt	Phone: 06151-82699-0 Fax: 06151-82699-11

Test Method

Method:	A Test of a building in use
Standard:	Following EN 13829
Note:	

Test object:

Test object:	see comments		
Internal Volume V:	492 m ³	Error: +/- 3 %	Calculation Reference Values:
Net Floor Area A _F :			see appendix
Envelope Area A _E :			
Type of Ventilation:	<input type="text" value="None"/>		
Type of Heating System:	Gasheizung		
Type of Air Conditioning:	keine		
Additional Information you will find in "Comments".			

Air-moving Equipment

Device:	Minneapolis BlowerDoor Modell 4, APT		
Serial Numbers:	Fan: _____	Pressure Gauge: APT8 - 72	Calibration: 09.06.06
Other Devices:	_____ _____		

BlowerDoor Test

Test Standard EN 13829, Method A

Minneapolis BlowerDoor Modell 4 - Tectite Express 3.6.7.0

Object: end-terrace house 54321 Passivhausen	Technician Passivman Date: 31.02.2015
---	--

Temperature and Wind Conditions

Inside Temperature: 7 °C	Wind Force: 3
Outside Temperature: 5 °C	Number of exterior pressure taps: 1
Barometric Pressure: (Standard): 101325 Pa	Building Wind Exposure: B
Uncertainty because of Wind (Table Geißler): 9 %	

Depressurization

Zero Flow (baseline)	Δp_{01+}	Δp_{01-}	Δp_{02+}	Δp_{02-}
	3.7 Pa	-0.7 Pa	0.3 Pa	-0.5 Pa

Pressurization

Zero Flow (baseline)	Δp_{01+}	Δp_{01-}	Δp_{02+}	Δp_{02-}
	0.7 Pa	-0.4 Pa	5.0 Pa	-

Sets of Measurement

Ring	Building Pressure	Fan Pressure	Fan Flow V_f	Tolerance	Ring	Building Pressure	Fan Pressure	Fan Flow V_f	Tolerance
O ABCDE	[Pa]	[Pa]	[m³/h]	[%]	O ABCDE	[Pa]	[Pa]	[m³/h]	[%]
Δp_{01}	3.5	—	—	—	Δp_{01}	0.5	—	—	—
C	-80	272	347	0.14	C	79	282	354	4.51
C	-67	224	314	1.40	C	65	180	281	-3.27
C	-55	168	271	-0.88	C	59	163	266	-1.04
C	-53	160	265	-1.47	C	56	148	254	-2.05
C	-46	141	247	0.48	C	49	123	231	-0.08
C	-36	105	212	-0.04	C	39	90	197	1.50
C	-24	66	168	0.39	C	29	54	151	0.62
Δp_{02}	0.1	—	—	—	Δp_{02}	5.0	—	—	—

Correlation Coefficient r : 0.999		Confidence interval			Correlation Coefficient r : 0.996		Confidence interval		
C_{env}	[m³/(h Pa ⁿ)]	20	max. 22	min. 18	C_{env}	[m³/(h Pa ⁿ)]	13	max. 17	min. 9
C_L	[m³/(h Pa ⁿ)]	20	max. 23	min. 18	C_L	[m³/(h Pa ⁿ)]	13	max. 17	min. 9
n	[-]	0.64	max. 0.67	min. 0.61	n	[-]	0.75	max. 0.84	min. 0.67

Results

V =	492 m³	A _F =		A _E =	
-----	--------	------------------	--	------------------	--

	V_{50}	Uncertainty	n_{50}	Uncertainty	w_{50}	Uncertainty	q_{50}	Uncertainty
	m³/h	%	1/h	%	m³/m²h	%	m³/m²h	%
Depressurisation	250	+/- 12 %	0.51	+/- 12 %				
Pressurisation	244	+/- 12 %	0.50	+/- 12 %				
Average	247	+/- 12 %	0.50	+/- 12 %				

Regulation complied with:

PHI

Maximum allowable:

0.6	1/h				
------------	-----	--	--	--	--

The test results meet the regulation.

Note: The result does not exclude faults in the construction.

Business Info: Passivman

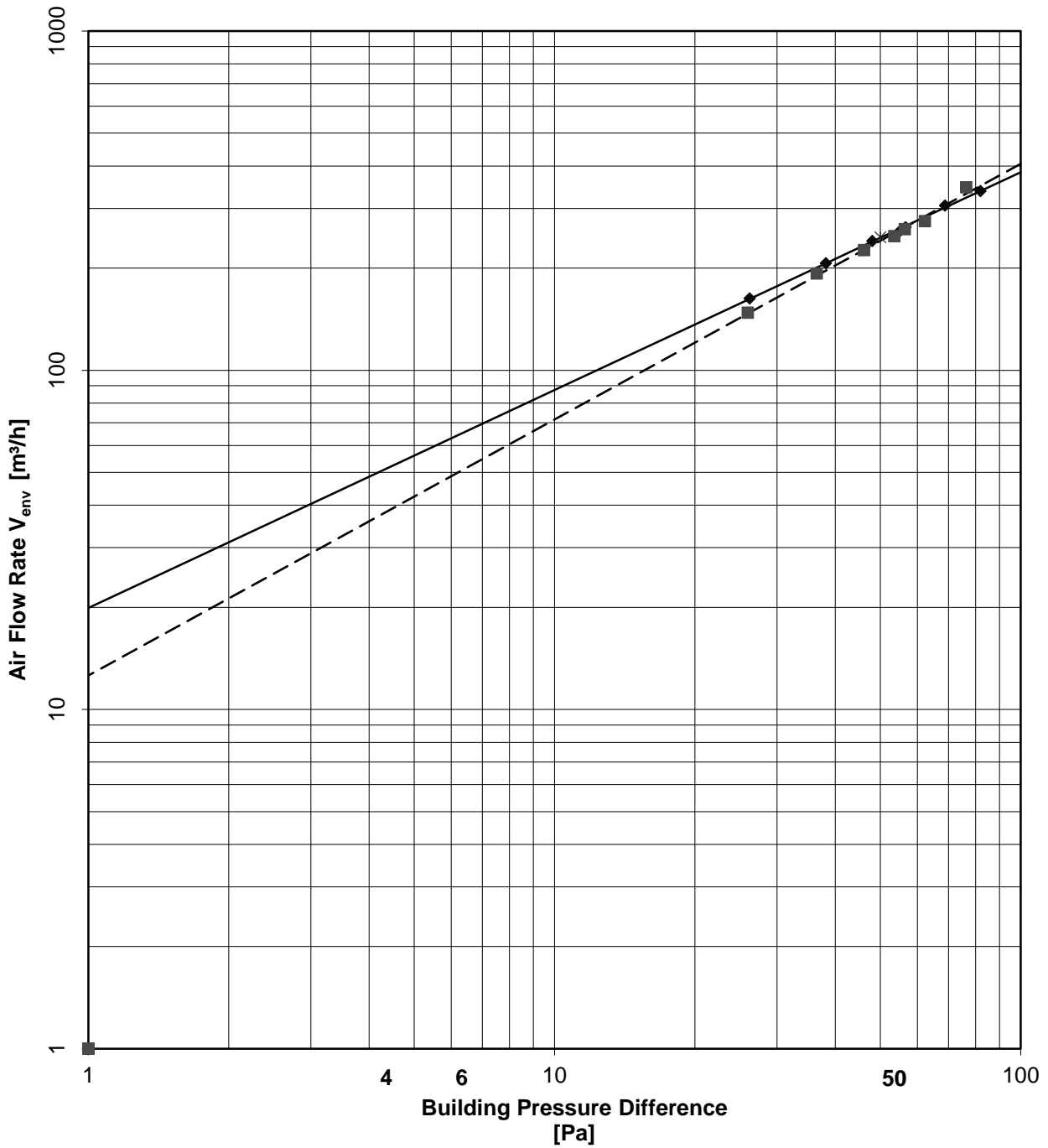
Passivhaus Institut Dr. W. Feist

64283 Darmstadt

Date, Sign

Stamp

BlowerDoor Air Leakage Graph Object: end-terrace house



- ◆ (Air Flow) Depressurisation [m^3/h]
- (Air Flow) Pressurisation [m^3/h]
- Regression line Depressurisation [m^3/h]
- - - Regression line Pressurisation [m^3/h]
- × Air Flow Rate at 50 Pa [m^3/h]

BlowerDoor Test

EN 13829, Method A

Comments

Object: end-terrace house 54321 Passivhausen

Technician: Passivman Datum: 01.05.17
--

Installation of the Blower Door in the entrance door.

The building is closed, all windows and doors are installed. Window sills are installed, that is why the airtightness layer there is not accessible anymore.

The door sill of the garden door was not installed yet, so the door has been temporarily sealed.

The floor screed was already present.

The ventilation unit is present and the openings are temporarily closed.

Main leaking points:

Room Living room - electrical socket strong air draught

Room Kitchen - window connection down

Room HVACR - cable penetration

Room studio - window connection left

Pipe penetration outside air - connection to the plaster down

BlowerDoor Test

EN 13829, Method A

Zero-Flow (Baseline) and Accuracy

Object: end-terrace house 54321 Passivhausen	Technician: Passivman Date: 01.05.2017
---	---

Depressurization

Reading	Zero Flow Pressure Difference	
	At the Beginning	At the End
1	4.0	-1.4
2	3.9	-0.5
3	5.5	-0.2
4	5.8	0.0
5	7.0	0.1
6	7.5	0.3
7	6.8	0.1
8	6.0	0.0
9	2.6	0.0
10	0.9	0.2
11	2.4	0.0
12	3.1	0.3
13	7.2	0.5
14	9.2	0.7
15	5.6	0.7
16	3.6	0.6
17	2.4	0.3
18	0.3	0.1
19	-0.7	0.1
20	1.1	0.3
21	2.2	0.5
22	3.4	0.6
23	1.8	0.5
24	2.9	0.4
25	5.0	0.4
26	2.7	0.1
27	0.9	-0.2
28	1.3	-0.6
29	0.9	-0.7
30	1.1	-0.7

Pressurization

Reading	Zero Flow Pressure Difference	
	At the Beginning	At the End
1	2.2	8.8
2	1.6	9.3
3	0.7	11.0
4	1.2	8.7
5	0.9	7.1
6	-0.3	7.3
7	-0.8	5.5
8	-0.7	4.7
9	-0.3	6.3
10	-0.1	4.5
11	0.2	4.0
12	0.1	4.1
13	0.4	4.2
14	0.7	3.6
15	0.6	3.5
16	0.6	3.6
17	0.5	2.6
18	0.5	2.9
19	0.5	3.2
20	0.6	3.4
21	0.5	2.8
22	0.5	3.0
23	0.6	2.8
24	0.9	3.5
25	0.8	3.0
26	-0.2	4.4
27	0.0	7.0
28	0.4	4.6
29	0.7	6.0
30	0.7	5.0

Average of the positive and negative Values of Zero Flow Pressure Difference

	Δp_{01+}	Δp_{01-}	Δp_{02+}	Δp_{02-}
Average	3.7	-0.7	0.3	-0.5

Average of all Values of Zero Flow Pressure Difference

Zero Flow (baseline)	Δp_{01} [Pa]	Δp_{02} [Pa]
	3.5	0.1

Note:

Accuracy (Proposal Germany: FLiB-Supplement 11/2001)

Name	Description	Depressurisation		Pressurisation	
a	Accuracy of the device to measure airflow rate	+/- 4 %		+/- 4 %	
b	Accuracy building pressure	+/- 3 %	50 Pa	+/- 4 %	50 Pa
c	Uncertainty because of wind	+/- 9 %		+/- 9 %	
d	Uncertainty barometric pressure (standard or measured)	+/- 5 %		+/- 5 %	
e	Uncertainty leaving out a depressurization or pressurization	+/- 0 %		+/- 0 %	
g	Uncertainty reference values	+/- 3 %		+/- 3 %	
only info	Random error of the airflow rate	+/- 1 %		+/- 3 %	