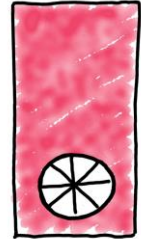


# The Standard-Compliant BlowerDoor Final Measurement



## Why – When – What - How

## Purpose of measurement

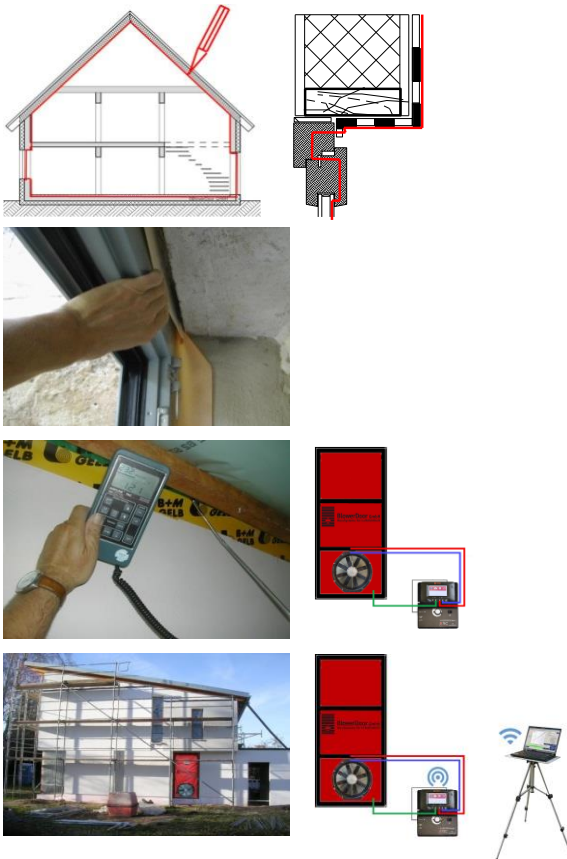
The BlowerDoor final measurement takes place at the end of the construction process. Its purpose is mainly to **prove compliance with limit values** (e.g. air change rate) for a regulation, a standard, or a subsidy programme, etc.

### The measurement includes:

- **Leakage detection and documentation** for plausibility control of the measurement result
- **Depressurization and pressurization measurement series** depending on the standard or requirement for **determining the characteristic value** (e.g. the air change rate) for comparison with the required limit value
- **Test report** conforming to standards

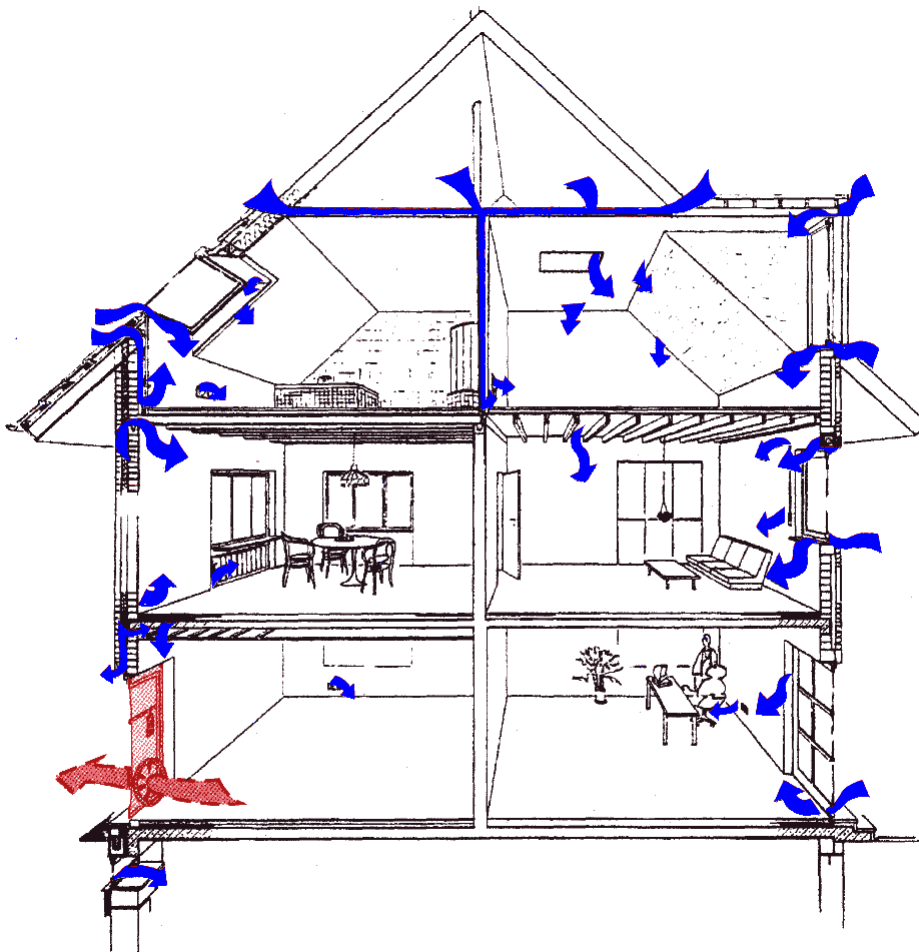
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## Classification of the BlowerDoor final measurement in the construction process



- Determining the limit value
- Establishing a detailed plan of the airtight envelope
- Self-monitoring during construction process
- **Conducting a final BlowerDoor test**
- Measurement of air permeability in existing buildings

## The principle of the BlowerDoor Test



**Inspection of the building envelope by means of pressure difference:**

The BlowerDoor measuring fan sucks air out of the building. Outside air flows through leaks into the building (blue arrows).

## Measurement equipment



*BlowerDoor Standard*

- Measuring system BlowerDoor Standard or Measuring system BlowerDoor MiniFan with pressure gauge DG-1000 or DG-700
- Laptop with TECTITE Express software



*BlowerDoor MiniFan*



*GFTB 200 Hygro-/  
Thermo-/Barometer*

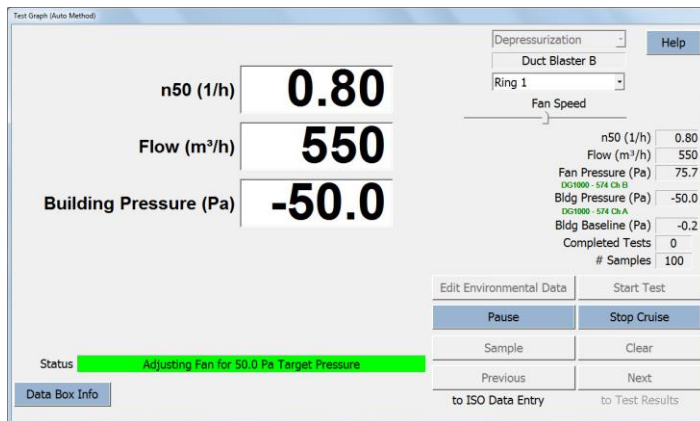
# Leakage detection



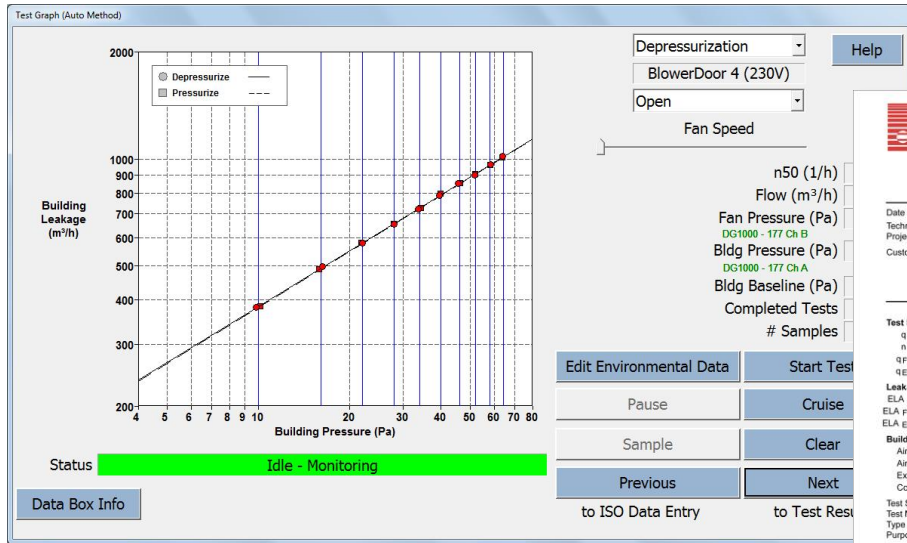
## 1. Leakage detection at depressurization

- with the cruise function of the DG-1000
- with the software TECTITE Express or
- with the app TEC Gauge.

## 2. Documentation of major leaks



# Conducting the final measurement conforming to standards



**BLOWERDOOR GmbH**  
MessSysteme für Luftdichtheit

**BUILDING LEAKAGE TEST**  
BlowerDoor GmbH  
Zum Energie- und Umweltzentrum 1  
Springe, GERMANY 31832  
Phone: +49 (0) 5044-97540 Fax: +49 (0) 5044-97544  
Email: info@blowerdoor.de Website: www.blowerdoor.de

Date of Test: 30.07.2017 Test File: Test\_1  
Technician: Example Project Number: 23401  
Customer: Mr. Joe Miller 1 Main Street Yourtown, 2345 Phone: +44 (0) 12-3456780 Fax: +44 (0) 12-3456789 Building Address: Single family house 2 High Street Anytown, 5678

**Test Results at 50 Pascals:**

	Depressurization	Pressurization	Ave
q50 : m³/h (Airflow)	891 (+/- 0.3 %)	888 (+/- 0.4 %)	89
n50 : 1/h (Air Change Rate)	2.94	2.93	2.1
q150 : m³/h·m² Floor Area)	5.48	5.45	5.4
qE50 : m³/h·m² Envelope Area)	1.95	1.94	1.1

**Leakage Areas:**

ELA 50 : m²	0.0272 (+/- 0.4 %)	0.0271 (+/- 0.4 %)	0.1
ELA F50 : m²/m²	0.0001869	0.0001863	0.1
ELA E50 : m²/m²	0.0000594	0.0000592	0.1

**Building Leakage Curve:**

Air Flow Coefficient (C <sub>env</sub> ) m³/h·Pa <sup>n</sup>	115.5 (+/- 1.6 %)	114.0 (+/- 2.1 %)
Air Leakage Coefficient (C <sub>L</sub> ) m³/h·Pa <sup>n</sup>	115.5 (+/- 1.6 %)	114.0 (+/- 2.1 %)
Exponent (n)	0.522 (+/- 0.005)	0.525 (+/- 0.006)
Coefficient of Determination (r²)	0.99988	0.99980

Test Standard: ISO 9972  
Test Mode: Depressurization and Pressurization  
Type of Test Method: Method 2 - Test of building envelope  
Purpose of Test: Check EN15 n50 ≤ 1.5 1/h

**BUILDING LEAKAGE TEST Page 4 of 5**

Date of Test: 30.07.2017 Test File: Test\_1

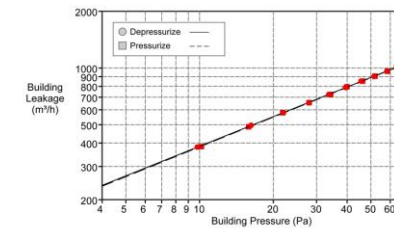
**Pressurization Test 1:**

Indoor Temperature (°C)		Outdoor Temperature (°C)		Barometric Pressure (Pa)	
20.0		20.0		101325.0	

Pre-Test		Baseline Pressure Data		Post-Test	
Δp <sub>0,1</sub> -	Δp <sub>0,1</sub> +	Δp <sub>0,1</sub>	Δp <sub>0,2</sub> -	Δp <sub>0,2</sub> +	Δp <sub>0,2</sub>
-0.2	0.1	-0.1	-0.3	0.2	-0.1

**Data Points - Automated Test (TTE 5.1.7.3)**

Nominal Building Pressure (Pa)	Baseline adjusted Building Pressure (Pa)	Fan Pressure (Pa)	Nominal Flow q <sub>r</sub> (m³/h)	Adjusted Flow q <sub>env</sub> (m³/h)	Adjusted Flow q <sub>L</sub> (m³/h)	% Error	Fan Configuration
-0.1	n/a	n/a	1007	1007	1007	-0.1	Ring B
63.8	63.7	157.1	1007	961	961	-0.2	Ring B
58.3	58.4	142.9	961	906	906	-0.1	Ring B
51.9	52.0	128.8	906	852	852	-0.1	Ring B
46.2	46.3	112.0	852	795	795	0.7	Ring B
39.9	40.0	97.5	795	724	724	-0.6	Ring B
34.2	34.3	80.8	724	655	655	0.0	Ring B
27.9	28.0	66.0	655	579	579	0.7	Ring B
21.7	21.8	51.5	579	487	487	0.3	Ring B
15.7	15.8	36.4	487	383	383	-0.6	Ring C
10.1	10.2	28.0	383	383	383		
-0.1	n/a	n/a					



3. Measurement series at depressure/overpressure with the software TECTITE Express

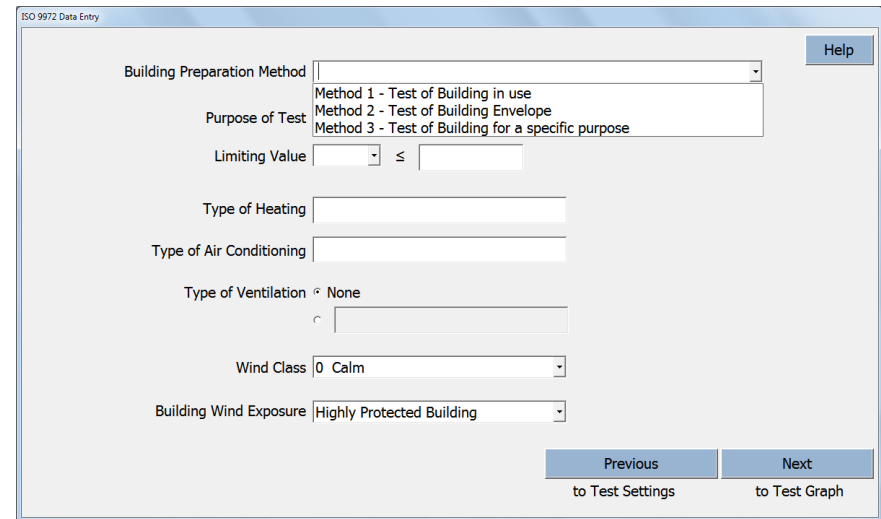
4. Generating the test report

## Basis for the measurement process

How a measurement is to be performed is regulated – depending on the scope – by **ISO 9972** or **EN 13829**.

The procedure is determined by the purpose of the measurement and is specified by the respective national requirements.

The chosen method determines which provisional seals may be used.



*Input mask in the TECTITE Express software*



## Literature and Links

The measurement procedure is described in the standards ISO 9972 and EN 13829.

Limit values are set in each country by different institutions or regulations. In Germany these are e.g.:

- Energieeinsparverordnung (Energy Saving Ordinance), a regulation describing minimum requirements regarding energy use of buildings; 2013-10
- DIN 4108-7 Thermal insulation and energy economy in buildings – Part 7: Air tightness of buildings – Requirements, recommendations and examples for planning and performance; 2011-01
- KfW a German state-owned development bank
- Passive House Institute (PHI) an independent research institute <https://passivehouse-international.org/>

