

The AirTightnessTester

Our new measuring instrument for air tightness



Niek-Jan Bink

ACIN instrumenten

TNO innovation
for life

ACIN instrumenten

TKI SecureVent



The project was carried out with a subsidy from the Ministry of Economic Affairs, National Regulations for Economic Affairs subsidies, Top Sector Energy implemented by the Netherlands Enterprise Agency.

1

Securevent project (2017-2020) initiated by TNO (Wouter Borsboom)

- In more than 80% of Dutch dwellings, the integral performance of the air system *upon completion* is found not to meet the minimum requirements of the building code. This has major consequences for the indoor air quality and energy performance of homes.
- The goal of TKI SecureVent is to better secure the integral performance of residential air systems (air quality, sound comfort and energy use).
- An essential condition for this is the availability of simple measuring instruments for the professional market, with which
 - 1) the airtightness of the building envelope,
 - 2) the air volume flow
 - 3) the noise level of the ventilation system can be tested in a fast and affordable manner.

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2

Our contribution to TKI SecureVent

Developing simple measuring instruments for the professional market with which

- The air permeability of the building envelope
- The air volume flow of the ventilation system (VentiFlow-mk2) can be measured quickly and affordably.



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TOPSECTOR ENERGIE
Empowering the new economy

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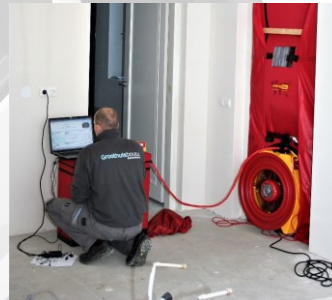
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Methodology Air Tightness

Airtightness is normally measured with a blower door

ACIN has developed the ATT based on a patented idea from TNO for a simplified measurement that the installer can carry out quickly.

It is not meant to replace the blower door but to supplement



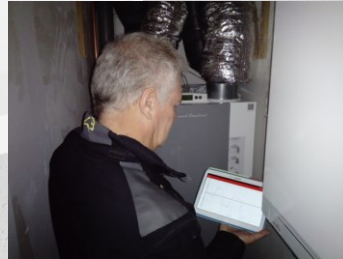
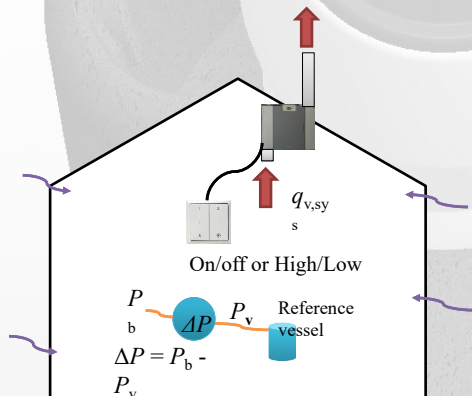
ACIN Air
Tightness
Tester
made in Holland

TNO innovation
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4

The AirTightnessTester (ATT)

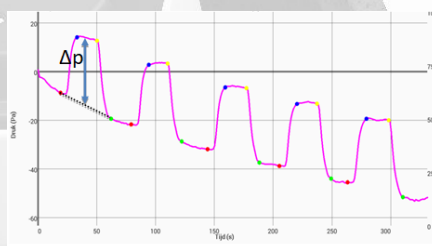
In the simplified air permeability measurement, the ventilation system present in the house is used to bring the house to underpressure or overpressure and to measure the air permeability.



5

Measuring with the ATT

- The ATT makes smart use of the ventilation system. The pressure vessel of the ATT serves as a reference (pressure in the house when the ventilation system is off).
- While the ventilation system is switched on and off a number of times, the pressure difference compared to the reference is measured.
- From this pressure difference and the air volume flow of the ventilation system, the air tightness is calculated

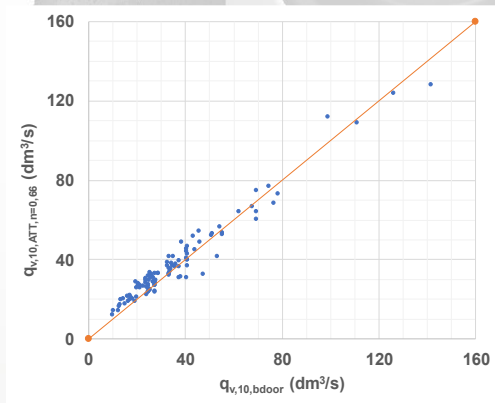


figuur 4: Typisch verloop van het gemeten drukverschil.

6

ATT Measurements

The ATT has been tested by Koppen Bouwexperts



Koppen bouwexperts is a specialist in the field of air tightness measurements with the blower door.

In 2018 and 2019, they compared the ATT with the blower door in a large number of homes.



7



Jury report

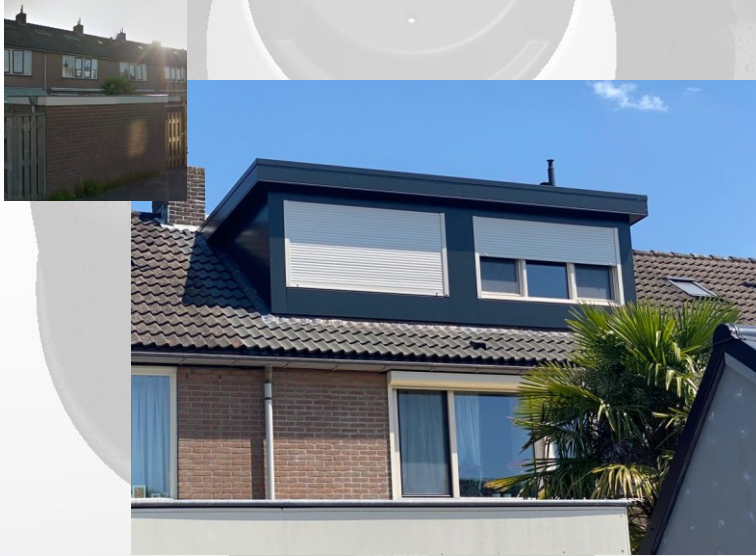


- Airtightness is the 'dark horse' of the energy transition
- Builders must measurably demonstrate their performance
- For installers, airtightness is an important precondition
- Serial housing and apartments to be tested quickly
- **Supplementary to the blower door test.**
- Installer as total package supplier and sustainability advisor.
- In (renovated) existing buildings, an installer can now really measure.



8

A new dormer



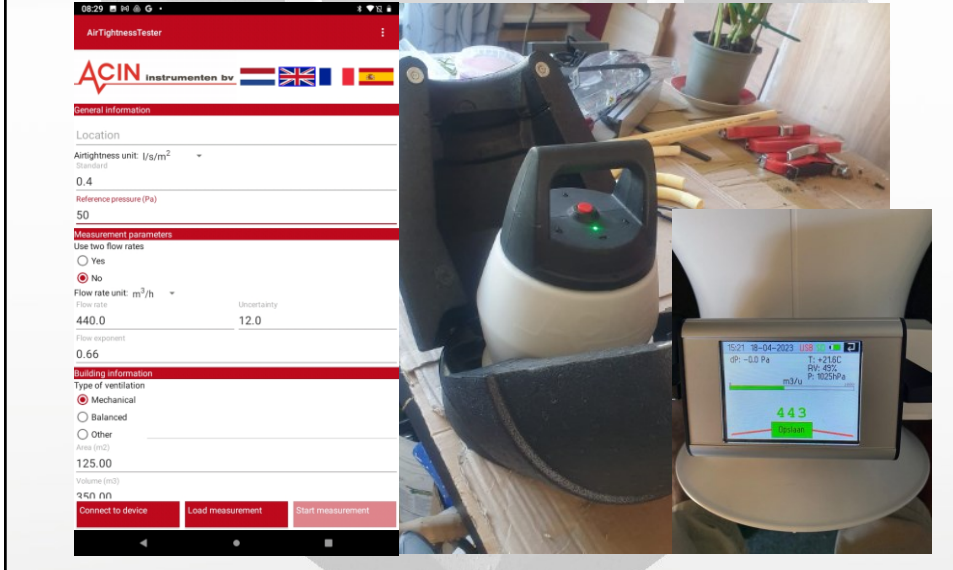
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Before...



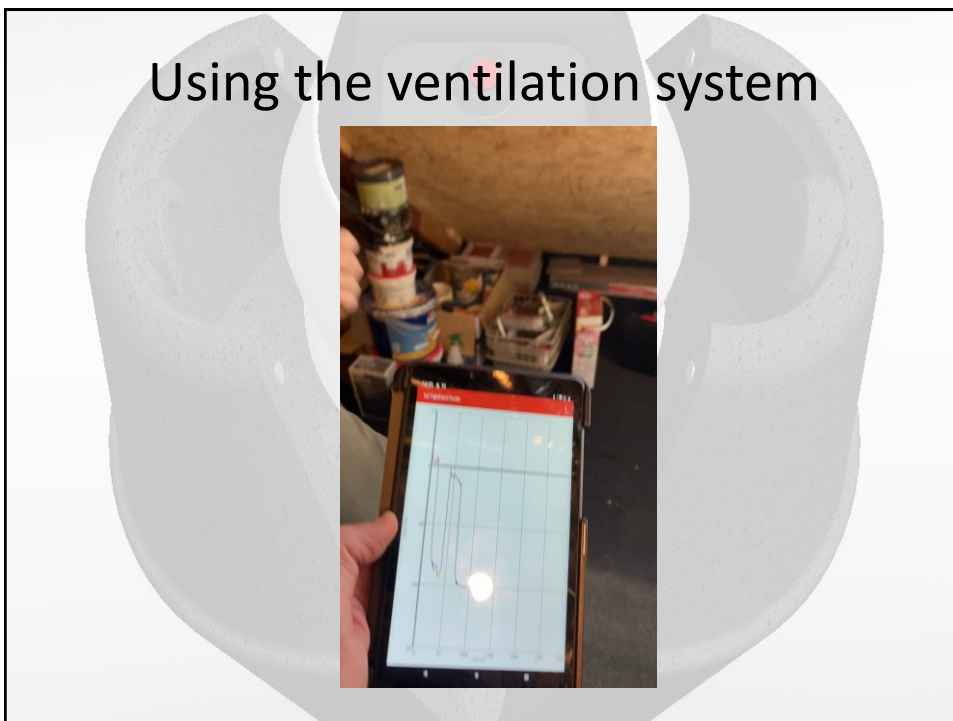
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Start measurement



11

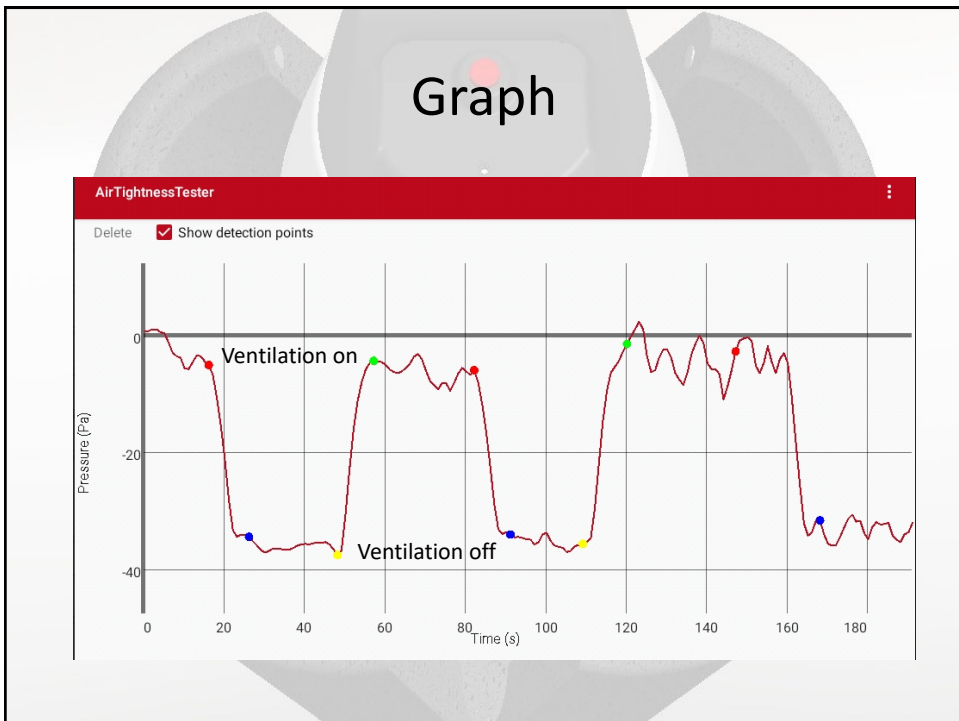
Using the ventilation system



12




13



14

Settings
Results

AirTightnessTester



General information

Date	2023-04-19
Start time	12:23:42
End time	12:28:52
Location	Korenbloem 57
Type of ventilation	Balanced


Measurement parameters

Standard	0.4 I/s/m ²	
Flow rate (low)	77.0 m ³ /h	Edit
Flow rate (high)	445.0 m ³ /h	Edit
Flow exponent	0.66	Edit
Area	125.0 m ²	Edit
Volume	Volume not filled in	Edit

Results

Average pressure	31.5±0.1 Pa
Airtightness@10Pa	0.44±0.06 I/s/m ² Edit

AirTightnessTester



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15



16



17

After ...

AirTightnessTester

ACIN instrumenten bv

General information	
Date	2023-06-16
Start time	12:17:37
End time	12:23:09
Location	
Type of ventilation	Balanced

Measurement parameters	
Standard	200.0 l/s/m ²
Flow rate	440.0 m ³ /h Edit
Flow exponent	0.66 Edit
Area	125.0 m ² Edit
Volume	350.0 m ³ Edit

Results	
Average pressure	4.2±0.5 Pa
Airtightness@10Pa	1.73±0.21 l/s/m ² Edit

18



Thanks!