

# Airtightness of building components

Building Component Performances as an Answer for  
Airtightness Issues – Existing Methods

Speaker  
**Martin Prignon**

Project **AirPath50** (2016 – 2020), funded by INNOVIRIS

**innoviris.brussels**   
empowering research

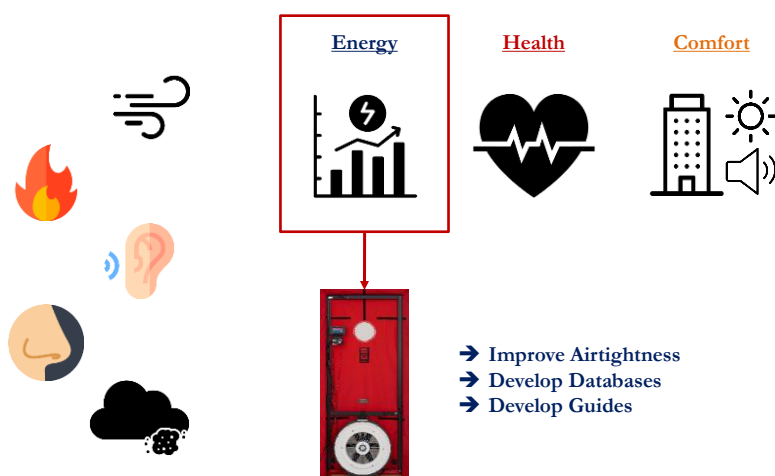
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## Infiltration, Consequences and Current Practice



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## Airtightness paradox in current practice

We promote fan  
pressurisation test

- It reports airtightness at 50 Pa.
- Assumes leakage uniformly distributed along the envelope.

**The consequences and the amount  
of air infiltration depend on leakage  
location and distribution.**

e.g., Internal vs. External leakage

See [Rogers, 2019]  
(40th AIVC Conference)

Looking at component scale in parallel  
with whole building performances.

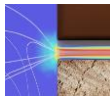
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## Quantification of Building Component Airtightness



### Numerical models

Airflow estimation through the development of  
fundamental equations of fluid mechanics.



### Laboratory testing

Measurement of  $\Delta p - q$  relation of the component  
in a highly controlled environment.



### *In-situ* testing

Measurement of  $\Delta p - q$  relation of the component  
directly on site.

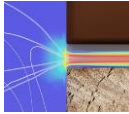
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## Advantages and Drawbacks



- No planning constraints
- Easy interpolation of models
- Transferrable to larger models

- Representation of reality
- Validation work needed
- Lack of crack data



- No planning constraints
- Control of variables
- Visualisation of the component

- Not “real configuration”:
  - o Component alone
  - o No dust, enough space, etc.



- Real configuration (i.e., includes workmanship quality)

- Planning constraints
- Uncontrolled environment

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## Presentations in this Webinar



### Old topic

TN 34: Air Flow Patterns within Buildings: Measurement Techniques

### New perspectives

Regain interest in health and comfort  
New directives for retrofit (Europe, 2018)

**Uncertainty Of Effective Leakage Areas Determination Through Reductive Sealing Technique**  
Vitor Cardoso

**Bias and Precision errors in the Measurement of Building Component Airtightness with Direct Component Test**  
Martin Prignon

**Comparison of Airflow and Acoustic measurements for Evaluation of Building Air Leakage Paths in a Laboratory Test Apparatus**  
Benedikt Kölsch

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