

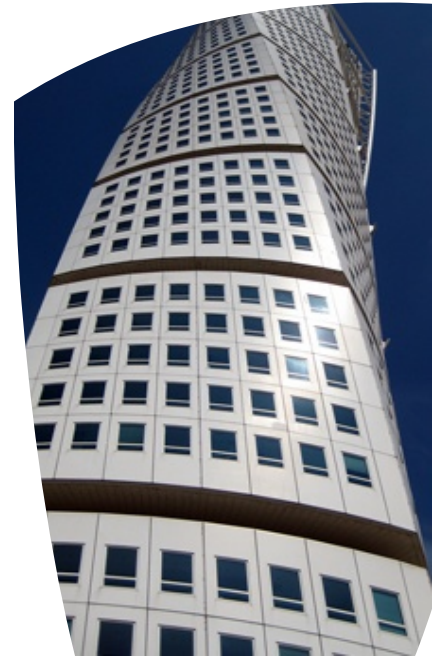
Foreword

The TightVent Airtightness Associations Committee now counts participants from 16 countries in Europe and North America. In parallel, TightVent Europe has been invited to a growing number of events either to give the status on European developments and perspectives on building and ductwork airtightness or to support new initiatives.

This trend demonstrates the major role of TightVent in disseminating information on building and ductwork airtightness and the help it provides to policy makers and professionals to deal with these issues, in particular in the context of the recast of the Energy Performance of Buildings Directive.

This newsletter will give you information on selected initiatives which we hope you will find useful. We would like to encourage you to join us for our future webinars (free of charge, see our [event calendar](#)), workshops and conferences for more information and fruitful exchanges.

Peter Wouters, *Manager INIVE EEIG*



Workshop on “Quality of Methods for Measuring Ventilation and Air Infiltration in Buildings” in Brussels, Belgium, 18-19 March 2014

The objectives of this workshop are to review and to discuss:

- Recent and existing measurement methods for ventilation and air infiltration in buildings;
- Methods to estimate the uncertainty of those measurements;
- Conditions to obtain results whose quality is compatible with the purpose of the measurement;
- Conditions for large-scale implementation and pitfalls to avoid.

The workshop will address primarily field measurement of airflow rates, air exchange rates, air velocities, and pressures.

Interested parties are invited to submit an abstract by 15 November 2013 to info@aivc.org. Notification of abstract acceptance: 15 December 2013. Deadline for paper submission: 15 February 2014.

More information on: www.aivc.org

The workshop is organised by INIVE on behalf of the AIVC (Air Infiltration and Ventilation Centre); TightVent (Building and Ductwork Airtightness Platform); and venticool (the International platform for ventilative cooling, www.venticool.eu).

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New publications

- ✓ d'Ambrosio Alfano, F., Dell'Isola, M., Ficco, G., & Tassini, F. (2012). *Experimental analysis of air tightness in Mediterranean buildings using the fan pressurization method*. Building and Environment, 53, 16-25.
- ✓ Sinnott, D., & Dyer, M. (2012). *Airtightness field data for dwellings in Ireland*. Building and Environment, 51, 269–275.
- ✓ Van Den Bossche, N., Huyghe, W., Moens, J., Janssens, A., & De paepe, M. (2012). *Airtightness of the window–wall interface in cavity brick walls*. Energy and Buildings, 45, 32-42.
- ✓ Walker, I., Sherman, M., Joh, J., & Chan, W. (2013). *Applying Large Datasets to Developing a Better Understanding of Air Leakage Measurement in Homes*. International Journal of Ventilation, 11, 323-337.
- ✓ Wanyu R., C., Joh, J., & Sherman, M. (2013). *Analysis of Air Leakage Measurements of US Houses*. Energy and Buildings, 66, 616-625.

TightVent Airtightness Associations Committee continues to grow

The TightVent Airtightness Associations Committee (TightVent TAAC committee) was launched on September 26, 2012. Its primary goal is to promote reliable testing and reporting procedures. Since September 2012, the committee had a physical meeting in Hannover before the BUILDAIR symposium and has met five times (via internet).

At present, the committee has participants from 16 countries in Europe and North America: Czech Republic, Denmark, France, Germany, Sweden, UK, Belgium, Norway, Poland, Estonia, Ireland, Latvia, USA, Hungary, Croatia and Canada.

The scope includes various aspects:

- airtightness requirements in the countries involved
- competent tester schemes in the countries involved

- applicable standards and guidelines for testing
- collection of relevant guidance and training documents

Conditions for joining are described at www.tightvent.eu/partners/taac.

Recordings available

BUILD UP Webinar – Building and Ductwork Airtightness: Legislative Drivers, New Concerns and New Approaches

The recordings and slides for this webinar are now available [here](#).

TightVent Belgium – A new local network of airtightness testers

BBRI and TightVent Europe have organised in Brussels on July 2 an information day on airtightness issues in the Belgium context. 52 persons exchanged points of views based on presentations that addressed in particular: the consultation process with stakeholders; the revision of ISO 9972; the development of technical guide; a review of quality schemes in Europe and the potential development of a quality framework in the Belgium context. Given the positive feedback of the participants on the relevance of such meetings, it is likely to lead to the inauguration of a Belgian network named "TightVent Belgium".

Flemish workshop on airtightness, Brussels, 4 September 2013

120 persons attended this workshop, which was organised by Flemish energy agency (VEA), the Flemish Royal association of engineers and BBRI. Presentations ranged from theoretical background to technical details via energy regulation context and issues as well as quality issues. TightVent Europe has been invited to give a presentation linked to the development of quality framework for airtightness measurements.

Lessons learnt from 3 field studies on airtightness durability

Maria Kapsalaki, INIVE

In 2002, the Fraunhofer Institute for Building Physics measured the airtightness of a series of 52 row houses compliant with the passive house standard in Stuttgart right after the construction phase. The measurements were repeated 2 years later. The initial air leakage test of all 52 row houses resulted in an average air change rate at 50 Pa (n_{50} value) of 0.37 h^{-1} , while the re-test of 31 of the houses measured 2 years later showed a slight increase of the n_{50} value by an average value of 0.09 h^{-1} . 5 out of the 31 buildings measured in 2002 no longer complied with the



original requirement of $n_{50} \leq 0.6 \text{ h}^{-1}$ but kept a relatively good airtightness level (maximum n_{50} value of 0.9 h^{-1}) compared to “standard” buildings.

A more recent study from B. Bossard and U.P. Menti presented during the 8th International BUILDAIR-Symposium held in Hannover in June 2013 showed no correlation between the durability of airtightness and the age of the building. The study involved air permeability tests on 25 buildings (single-multifamily homes, public buildings and schools, the majority certified as MINERGIE-P), in Switzerland, conducted from 1996 to 2012. For the great majority of the buildings measured, a difference of less than +/-20% between the first and the second measurement was observed.

Another recent report published in 2010 by the NHBC Foundation

presented results from airtightness measurements of 23 mixed type dwellings (attached –detached, masonry and timber frame) performed within a time interval of one to three years. The research concluded that 65% of the dwellings became less airtight on average by $1.5 \text{ m}^3 / (\text{h} \cdot \text{m}^2)$ at 50 Pa while the remaining sample got tighter with an average increase of $0.63 \text{ m}^3 / (\text{h} \cdot \text{m}^2)$ at 50 Pa. A further comparison between the different types of dwellings, construction material, heating and ventilation systems and the changes in the air permeability, over time, appeared to influence the performance to a certain extent, bearing in mind the limited sample size of the measurements.

Securing desired airtightness levels in the long term is crucial. It is a very complex field of study because durability depends on many aspects, some of which being very difficult to

objectively characterise. These range from the quality of the design and installation to the interaction of occupants. This may explain the differences between the partial conclusions of these studies. The papers of Erhorn et al. (2009) and Bossard and Menti (2013), focus on extremely airtight very low-energy buildings for which significant attention has probably been paid at design and execution for airtightness issues. Also, in these cases, the occupants are likely aware of the damage they can make to the airtightness layer, e.g. when drilling holes in walls. Therefore, it is not surprising that their results show less deviation between measurements performed on the same buildings than the third study with “standard” houses.

To make progress in this area, an important step consists in gathering data on larger samples of buildings

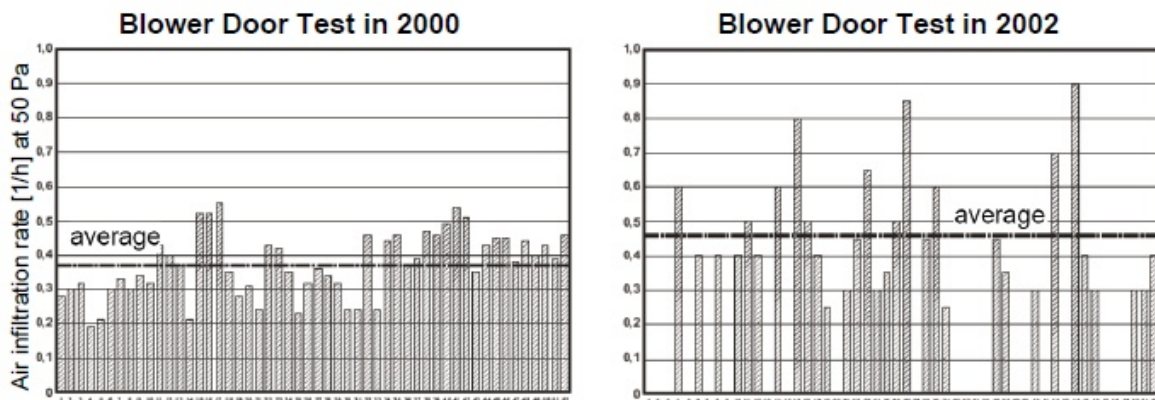


Figure 1: Results of airtightness measurements at 31 passive houses in Stuttgart, Germany measured right after the construction phase and 2 years later [1]

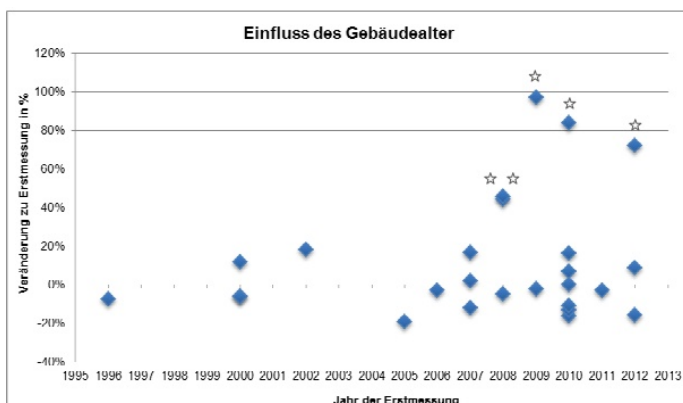


Figure 2: Air permeability tests of 25 buildings in Switzerland. Age modifications from the first measurements [2]

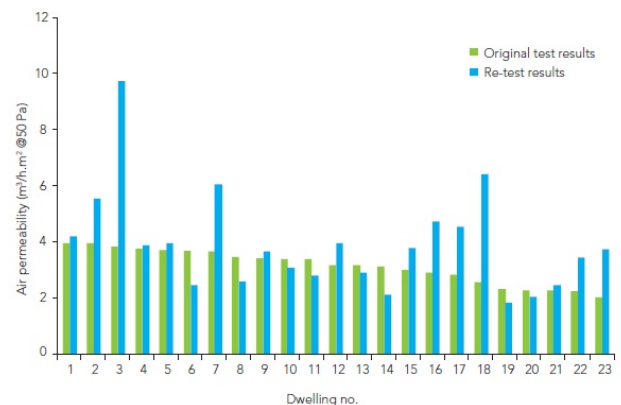


Figure 3: Air leakage test results at 23 dwellings in UK measured right after the construction phase and 1 to 3 years later [3].

taking into account key parameters—yet to be identified and characterised—influencing airtightness durability like design options, product choice and assembly, building operations and maintenance, building environment and climate.

In the meantime, from a practical point of view, experience suggests that careful design and follow-up of installation, as well as awareness raising among occupants are effective short term actions to promote in order to improve airtightness durability.

Works Cited

[1] H. Erhorn-Kluttig, . H. Erhorn and H. Lahmid, "Airtightness requirements for high performance building envelopes," in ASIEPI Information Paper P157, 2009.

[2] B. Bossard and U.-P. Menti, "Luftdurchlässigkeitsmessung: Momentaufnahme oder langfristiges Qualitätsmerkmal?," in 8th International BUILDAIR-Symposium, Hannover, 2013.

[3] T. Phillips, P. Rogers and N. Smith, "Ageing and airtightness- How dwelling air permeability changes over time," NHBC Foundation, 2011.

AIVC conference in 2014 in Poznań, Poland, 24-25 September 2014 "Ventilation and airtightness in transforming the building stock to high performance"

The 35th AIVC conference will be held in Poland together with the 4th TightVent and 2nd venticool conference. The conference is organised by:

- the International Network on Ventilation and Energy Performance (INIVE) on behalf of the Air Infiltration and Ventilation Centre (AIVC), TightVent Europe (the Building and Ductwork Airtightness Platform), venticool (the international platform for ventilative cooling); and
- the Poznań University of Technology.



Organisers:



Events Calendar

NOVEMBER 14: TightVent webinar on 'Airtightness testing: status and trends in competent tester schemes in the UK, Denmark and Belgium'. More information on: www.tightvent.eu

NOVEMBER 22: TightVent webinar on 'Airtightness testing: status and trends in competent tester schemes in Germany, Czech Republic and France'. More information on: www.tightvent.eu

MARCH 18-19, 2014: AIVC-TightVent-venticool workshop in Brussels, Belgium on 'Quality of Methods for Measuring Ventilation and Air Infiltration in Buildings'. More information on: www.tightvent.eu

SEPTEMBER 24-25, 2014: AIVC conference in 2014 in Poznań, Poland on 'Ventilation and airtightness in transforming the building stock to high performance'. More information on: www.tightvent.eu

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