

Newsletter No 12

Foreword

A recent survey amongst experts of the TightVent Airtightness Committee revealed changes in regulatory building airtightness requirements in 6 out of 10 countries since 2011 as well as significantly growing awareness. These are positive signs that should be reinforced with quality assurance measures to reduce the risk of discrepancies between claimed or expected and actual performance. Several good examples of such measures have been documented in the QUALICHeCK project and could serve as inspiration for other parties. Conversely, ductwork airtightness problems have been mostly overlooked in many countries in the past 5 years (although they seem resolved in Scandinavia). The new French compliance framework for ductwork airtightness testers or the airflow rate measurement requirements recently introduced in Belgium and the UK could initiate a positive market reaction.

This newsletter outlines several initiatives and findings to improve the compliance of building and ductwork airtightness. We wish you a pleasant reading and look forward to seeing you in our future events.

The TightVent team



Register now for the 13 -14 September 2017 - 38th AIVC & 6th TightVent conference in Nottingham, UK

155 abstracts have been submitted for presentation at the 38th AIVC- 6th TightVent & 4th venticool conference "Ventilating healthy low-energy buildings" to be held on 13 and 14 September 2017 in Nottingham, UK. The event will place its focus on:

- thermal comfort and ventilative cooling (the application of ventilation to cool indoor spaces and reduce overheating risk in buildings);
- air infiltration through cracks in the building envelope and ductwork;
- the relationships between ventilation, indoor air quality and health.

The conference will consist of 3 parallel tracks largely devoted to airtightness issues, ventilative cooling, ventilation in relation to IAQ and health. It will consist of a mixture of well prepared and structured sessions focused on the conference topics, presentations on invitation and presentations arising from the call for papers.

Specific topics of interest on the field of airtightness include:

- Durability of building and ductwork airtightness;

- Field data and case studies;
- Infiltration measurement techniques and IR thermography;
- Design and construction approaches for airtight buildings;
- Risks related to airtightness

Selected papers will be invited for submission to special issues of the 'Energy & Buildings' journal, the 'International Journal of Ventilation' and REHVA journal.

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 and venticool;
- Brunel University London
- The University of Nottingham
- The Chartered Institution of Building Services Engineers (CIBSE)

Registration to the conference is now open. To register please visit: <http://www.aivc2017conference.org/#register>

Programme information will follow so stay tuned at: <http://aivc2017conference.org>

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Keynote speakers at 38th AIVC Conference

- ✓ **Sani Dimitroulopoulou**, Public Health England
- ✓ **Cath Noakes**, University of Leeds
- ✓ **Tadj Oreszczyn**, the Chartered Institution of Building Services Engineers (CIBSE)
- ✓ **Peter Rankin**, Department for Communities and Local Government
- ✓ **Paul Ruyssevelt**, University College London (UCL)
- ✓ **Don Weekes**, Indoor Environmental Quality Global Alliance (IEQ-GA)
- ✓ **Ant Wilson**, Aecom

QUALICHeCK factsheets relevant to ventilation & airtightness



Because buildings are responsible for 40% of EU energy use and 36% of EU Greenhouse Gas (GHG) emissions, energy efficiency in buildings has become a priority in buildings to drastically reduce the energy use in buildings. While a number of policy measures have been implemented in Member States, the boundary conditions that are necessary for these measures to be effective have rarely been carefully addressed. On specific concern lies in the compliance of Energy Performance of Buildings Certificates (EPCs), which are the most visible instrument of the Energy Performance of Buildings Directive (EPBD), as well as the compliance of the quality of building works.

Based on a literature review and 10 specific field studies in 9 countries, each on samples of 25+ buildings, the EU QUALICHeCK project has confirmed this concern by showing that insufficient quality assurance measures increase the risk of discrepancies between claimed or expected and actual performance. Speaking about ventilation and airtightness, this could be the absence of controls of the reported building or ductwork airtightness values reported in the EPCs; this could also be the ambiguity left for the EPC expert to

choose the appropriate input data for a specific ventilation system.

The good news is that there are also interesting approaches that have been developed to contain some of these issues reported in the field campaigns. This ranges from competent tester schemes for building airtightness or ventilation system performance testers to databases developed to ease unambiguous EPC input data selection and control.

QUALICHeCK ended in February 2017. The consortium has archived its key findings in several reports and 59 factsheets. All are available on the QUALICHeCK [website](#)

Factsheets are short 2- to 10-page documents highlighting specific results. The factsheets specifically related to ventilation and airtightness issues, field data, and solutions are listed below:

- #01 | Building regulations can foster quality management — the French example on building airtightness
- #03 | French voluntary scheme for harmonised publication of ventilation product data
- #05 | Voluntary scheme and database for compliant and easily accessible EPC product input data in Belgium
- #06 | Regulatory compliance checks of residential ventilation systems in France
- #07 | Building airtightness in France — regulatory context, control procedures, results
- #09 | AMA – General material and workmanship specifications
- #10 | The Swedish Lågan programme for buildings with low energy use
- #11 | The Swedish Sveby scheme – standardise and verify the energy performance of buildings
- #18 | QUALICHECK Study Greece – Compliance with the reference values of the technical directives
- #21 | Quality framework for reliable fan pressurisation tests
- #27 | The Austrian building certification system IBO OEKOPASS
- #28 | Voluntary Green Building assessment paves the way for better as-built quality
- #30 | Critical situations on the construction site and ideas for quality assurance procedures: The German perspective
- #33 | Building air leakage rate in energy calculation and compliance procedures
- #42 | Selecting EPC input data for HVAC systems: a series of French guidance sheets
- #43 | baubook – easily accessible product information for EPC calculation provided by the Austrian database
- #44 | The quality assurance system of the German reconstruction loan corporation (KfW) in the field of energy-efficient construction and retrofitting (residential buildings)
- #45 | The Effnergie approach to ease transitions to new regulatory requirements
- #48 | Belgium/Flemish Region control and penalty scheme of the energy performance legislation: checking procedure and fines
- #50 | European certification of HVAC products can provide EPC input data
- #54 | Ductwork airtightness in France: regulatory context, control procedures, results
- #55 | Belgian/Flemish evaluation scheme for ventilation systems
- #56 | Certification of experts for the issuance of EPCs in Sweden

Building & ductwork airtightness requirements in Europe

Several European countries (e.g. Czech Republic, Denmark, Estonia, France, Germany, Ireland, Netherlands, Norway, Portugal, UK) include in their regulations either required or recommended minimum airtightness levels with or without mandatory testing.

Mandatory testing came gradually into force in the United Kingdom, Ireland, Portugal, Denmark and France.

In **Denmark**, with the [BR 2015](#) regulation, the local council is required to demand airtightness measurement in no less than 10% of construction projects. Airtightness testing is required for the low-energy standard 'Building class 2020' which anticipates 2020 regulatory requirements. Moreover, pressure testing must be made by an impartial, qualified building tester.

In **France**, the building thermal regulation requires explicitly justified building airtightness levels for residential buildings. The latest update of the French energy performance regulation ([RT 2012](#)), limits the airtightness value of a single family house below $0.6 \text{ m}^3/(\text{h}\cdot\text{m}^2)$ at 4 Pa (i.e. $3.2 \text{ m}^3/\text{h}\cdot\text{m}^2$ at 50 Pa) and of other residences below $1 \text{ m}^3/\text{h}\cdot\text{m}^2$ at 4 Pa (i.e. $5.4 \text{ m}^3/\text{h}\cdot\text{m}^2$ at 50 Pa).

In **Italy** there are no requirements on airtightness at national level, but in some regions there are [\[1\]](#). On 1

March 2010, the Province of Bolzano introduced, mandatory blower door tests (according to EN 13829) in case of energy certification of new dwellings [\[1\]](#). In other regions, it is often requested in the certification of buildings with a higher energy class ([province of Trento](#))[\[1\]](#).

In **Ireland**, [Technical Guidance Document L](#)- Conservation of Fuel and Energy – Dwellings (2017) subjects new dwellings to a pressure test in order to measure and confirm their air permeability prior to completion. Acceptable measured air permeability, should not be worse than the limit value of $7 \text{ m}^3/(\text{h}\cdot\text{m}^2)$ at a reference pressure of 50 Pa.

In **Portugal**, [mandatory requirements for ductwork airtightness](#) have been included in the regulation since 2006, as part of the implementation of the EPBD. Requirements for new HVAC systems include a set of mandatory tests that must be carried out during commissioning, before the building receives its use permit; these requirements apply to buildings larger than $1,000 \text{ m}^2$. To pass the test on airtightness, ductwork leakage may not exceed $1.5 \text{ L/s}\cdot\text{m}^2$ under a static pressure of 400 Pa.

In the **United Kingdom**, [Approved Document L1A](#): "Conservation of fuel and power in new dwellings of the Building Regulations 2010" subjects new dwellings to a pressure test in order to measure and confirm their airtightness on completion. Acceptable measured air permeability, should not be worse than the limit value of 10

$\text{m}^3/(\text{h}\cdot\text{m}^2)$ at a reference pressure of 50 Pa (same applies to non-dwellings above 500 m^2). Ductwork leakage testing should also be carried out where required by and in accordance with the procedures set out in B & ES DW/143 and B & ES DW/144 on systems served by fans with a design flow rate greater than $1 \text{ m}^3/\text{s}$.

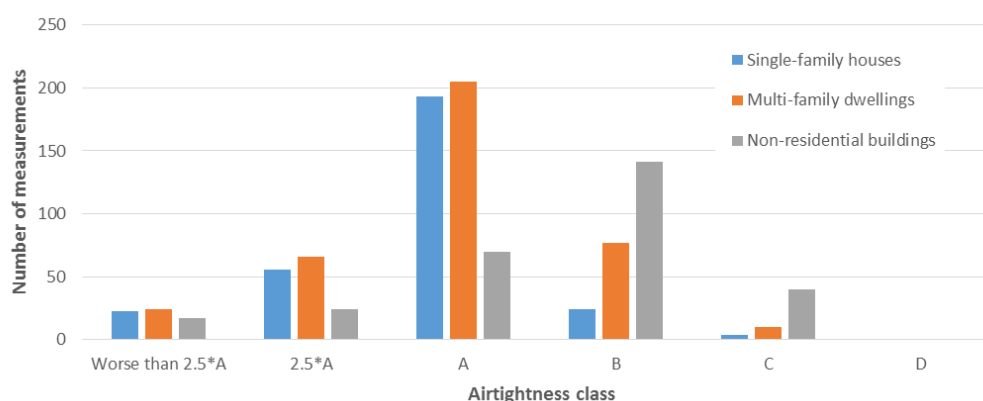
Ductwork airtightness gets better in France?

While ductwork airtightness has been an input parameter in the regulatory energy performance calculation of new buildings since its 2000 version, anecdotal evidence suggested little progress in the field. With a better physical modelling introduced in the 2012 version and a minimum requirement imposed in the Effinergie+ or BEPOS programmes, the situation seems to improve.

This observation is based on about 1000 measurement results collected within the new qualification schemes for ductwork airtightness testers. Whereas previous results showed airtightness results on average around 3 times leakier than class A (see [SAVE-DUCT results](#), p.30), the airtightness class distribution of this new dataset has shifted towards tighter systems (see figure below). This trend needs to be confirmed and amplified.

More information about the regulatory context and the control procedures on ductwork airtightness in France can be found in QUALICheck factsheet # 54

Ductwork airtightness class depending on building type



180 participants at BUILDAIR 2017

During the 10th edition of the international BUILDAIR symposium in Hannover, Germany, 180 participants had the opportunity to exchange their views based on 31 presentations from 11 countries. The topics addressed included qualification schemes for testers, development and analysis of large datasets, quality assurance, specific measurements (very large buildings, components characterization, radon, clean rooms), airtightness planning and execution, air leakage detection and moisture risk, ventilation measurements. TightVent is pleased to continue collaborating with BUILDAIR to promote exchanges across borders. During this event, we provided an overview of the impact of energy policies on building and ductwork airtightness in Europe which will be soon published in collaboration with AIVC.

Energy Efficiency and Indoor Climate in Buildings

Energy Efficiency and Indoor Climate in Buildings Energy Efficiency and Indoor Climate in Buildings is a monthly online newspaper containing relevant information on the Air Infiltration and Ventilation Centre (AIVC), the international platform on ventilative cooling (venticool) & IEA EBC annex 62-ventilative cooling, the building and ductwork airtightness platform (TightVent Europe), the Indoor Environmental Quality- Global Alliance (IEQGA), the QUALICheck project and the Dynastee network. The paper is available at the first of every month at: <http://news.inive.org>. Subscribe to get informed on a regular basis on the platforms' activities.

Shifting to ISO 9972:2015

The International Standard EN ISO 9972 "Determination of air permeability of buildings - Fan pressurization method", approved at CEN and ISO levels, was published in September 2015. As this new standard is progressively included in measurement specifications in member states, readers may be interested in the summary of major changes highlighted in an earlier TightVent archive <http://tightvent.eu/archives/2655>.

Product news from our partners

Retrotec's rCloud app has revolutionized the blower door and duct testing industries

Retrotec's rCloud has forever changed the method for blower door and duct testing. rCloud geolocates testing location, automatically performs blower door or duct tests to common standards, and creates secure compliance reports. Share immediately, view anywhere.

The app connects directly to a DM32 WiFi smart gauge. With the equipment setup, the tester opens rCloud on a smartphone or tablet, enters the address, and selects the test type. rCloud does the rest.

Download rCloud for free. Available for iOS, Android, and Windows 8.1 & 10.

View additional information about rCloud [here](#).



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