TightVent Europe
BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM

November 2018

Newsletter No 15

Foreword

The 2018 joint AIVC – TightVent – venticool conference Smart Ventilation for buildings in Juan-Les-Pins, France, proved highly successful with more than 200 participants from 27 countries attending the event and confirming once again the continuously growing interest in the fields of building & ductwork airtightness, (smart) ventilation, IAQ & health and ventilative/resilient cooling. The upcoming 2019 conference will be held in Ghent on 15-16 October and continue along the same lines focusing also on a historical evolution during the past 40 years; an event not to be missed!

In this edition of the TightVent newsletter we present the highlights of the 2018 conference i.e. a summary of the airtightness track of the event, 2 short articles based on papers presented during the airtightness track and news from the TAAC meeting held right after the conference. This edition concludes with product news from our partners. We wish you a pleasant reading and look forward to seeing you in 2019 in Ghent.

The TightVent team

15 -16 October 2019 – 40th AIVC & 8th TightVent conference in Ghent, Belgium

The 40th AIVC Conference "From Energy crisis to sustainable indoor climate – 40 years of AIVC" will be held on 15 and 16 October 2019 at 'Het Pand', the congress centre of Ghent University in Ghent, Belgium. It will also be the 8th TightVent conference and the 6th venticool conference.

Conference Scope & Concept

In the past 40 years, since the first oil crisis in the seventies, energy and climate goals have been shaping many countries´ policy and legislative agendas. The building sector plays a crucial role in achieving these goals, considering the energy use attributed to buildings and its huge potential for improved energy performance.

Whereas in the past most of the focus was on reducing the energy consumption, it is now clear that better performing buildings must ensure an acceptable Indoor Environmental Quality (IEQ), by providing higher Indoor Air Quality (IAQ) and comfort levels for their occupants. Building ventilation entails both challenges and opportunities to achieve this goal.

In 2019 the AIVC completes its 40th year of existence and the conference organisers thought that it would be good to pay a particular interest to the evolution during these 40 years.

This is the context defining the core theme of the joint 40th AIVC, 8th TightVent and 6th venticool Conference as: "From Energy crisis to sustainable indoor climate – 40 years of AIVC".

The conference will consist of 3 parallel sessions largely devoted to: Smart ventilation, Indoor Air Quality (IAQ) and health relationships; Airtightness; and Ventilative cooling – Resilient cooling.

The conference programme will include well-prepared and structured sessions focused on the conference topics, invited speakers, long and short oral presentations arising from the call, as well as 90 seconds industry presentations.

Call for Abstracts & Topical Sessions

This year, there are 2 new features:

- 2 separate calls for abstracts & papers depending on whether the authors are interested in the peer review of their papers.
- A call for topical sessions

Detailed information & important deadlines for the 2 calls for abstracts can be obtained here.

Detailed information & important deadlines for the call for topical sessions can be obtained here.

For further information please visit: https://www.aivc2019conference.org/

In this issue

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Feedback from the 39th AIVC & 7th TightVent conference: Summary of the airtightness track

More than 200 participants attended the joint 39th AIVC – 7th TightVent – 5th venticool conference held in Juan-Les-Pins, France on September 18-19, 2018. The programme consisted of 3 parallel sessions with contributions from 27 countries and international organisations. Around 150 presentations were given covering the main conference topics namely: Smart Ventilation, Indoor Air Quality and Health relationships; Ventilation and (building) Airtightness; Ventilative cooling - Resilient cooling.

It has also been a major discussion place for on-going or recently launched projects and initiatives such as the Indoor Environmental Quality – Global Alliance (IEQ-GA), the IEA EBC annex 80 "Resilient Cooling" and the IEA EBC annex 78 "Supplementing Ventilation with Gas-phase Air Cleaning, Implementation and Energy Implications".

The "Ventilation and (building) Airtightness" track at the AIVC 2018 conference consisted of 34 presentations organised in 6 sessions, 3 of which were topical sessions with a number of invited presentations:

1. Analysing airtightness measurements
2. Ductwork airtightness (topical session)
3. Integrating uncertainties in declared airtightness results (topical session)
4. New methodologies and improvements for airtightness
5. Demand controlled ventilation
6. Performance of heat recovery ventilation in practice (topical session)

The article available here provides a summary of the main trends and conclusions addressed during the presentations and discussions on building & ductwork airtightness.

First results of a new database on airtightness in Spain

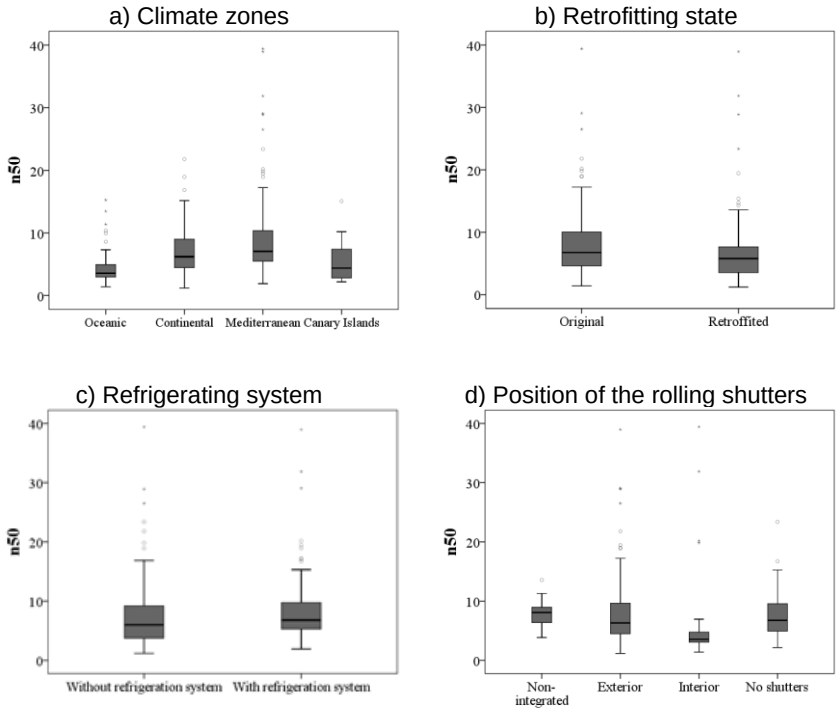
Irene Poza-Casado, University of Valladolid, Spain (irene.poza@uva.es)

401 buildings constitute this database at the moment, which has been created with the aim of setting the basis of a national and further developed one.

The concern for the energy performance of buildings, and specifically for air infiltration, has grown in the past few years. However, in the Mediterranean countries, and in the case of Spain in particular, climate benevolence and the tradition of ventilating naturally have led to a lack of knowledge on this field and the absence of regulations that take air infiltration into account.

INFILES project aims to characterize the envelope of existing housing stock in Spain in relation to airtightness. Through an extensive field study in collaboration with 9 universities, apartments and houses of different typologies and years of construction have been analysed. The airtightness level of the tested cases was measured with the extended technique Blower Door test, according to EN 13829. The software tool infil-APP was developed to assist a wide characterization of the dwellings in a uniform and systematic way, standardizing assessment criteria among technicians.

The mean air change rate (n50) obtained for the whole dataset was 7.52 h^{-1}, with a wide spread of the results, from 1.19 to 39.42 h^{-1}. Furthermore, an analysis was performed in order to statistically verify the independence of different variables. Regarding climate zone, a statistical relationship with the air change rate was found. It is relevant the fact that dwellings in the Mediterranean area are leakier than the ones located in the Continental area, which could be due to the extreme temperature conditions of the Continental area. Furthermore, an improvement on the air change rate



Airtightness of the tested dwellings (Poza-Casado et al. 2018).

was found for retrofitted dwellings. As for conditioning systems, dwellings with refrigerating system were leakier, even though the performance and efficiency of these systems is affected by infiltrations. Finally, the impact of the position of rolling shutters was also relevant. On the other hand, no significance was obtained related to the period of construction, typology, heating system or construction technology.

A great potential for energy savings through the improvement of construction elements can be deduced from the results. Nevertheless, a larger sample should be considered in order to draw more accurate results. Further conclusions will be derived from a deeper analysis of the data and the increase of the number of cases tested.

Support for this work was provided by the Spanish Ministry of Economy and Competitiveness (ref. BIA2015-64321-R).

Note: *This article is based on a paper presented at the AIVC 2018 conference (Poza-Casado et al.2018). The full paper will be available on AIVC's AIRBASE in March 2019.*

Impact of envelope leakages distribution on Demand Control Ventilation performance

Xavier Faure, University of Paris-Saclay, France

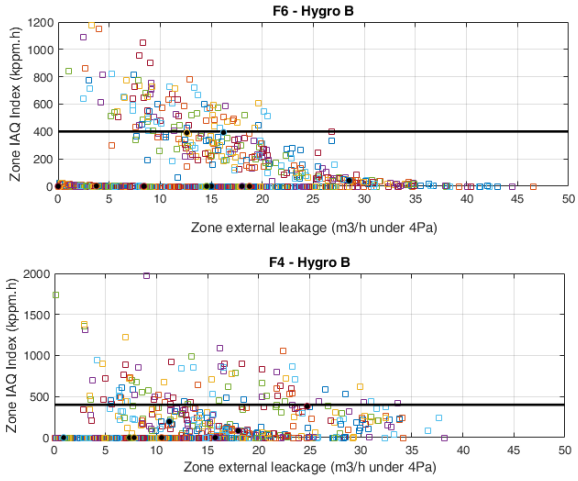
Demand control ventilation (DCV) involves modulating the extracted or supplied airflow depending on one or several indoor parameters. Due to the different energy performance (EP) regulations worldwide and the associated energy use targets, the application of DCV in residential buildings has increased significantly. It is an effective way to comply with both today's energy and indoor air quality (IAQ) concerns. Aside from DCV development but closely linked to it, building envelope airtightness has largely improved. In France, with the last two EP-regulations (RT2005 and RT2012) the building envelope leakage has decreased from a default value of 1.3 to a required value of 0.6 m3/h/m² under 4 Pa of pressure difference. RT2012 requires either an airtightness test or the implementation of a quality framework. Humidity based DCV is nowadays considered as the reference ventilation system for new construction in France. It is based on passive humidity sensors which enable the modulation of inlet and /or outlet device opening sections, thus leading to a linear airflow modulation depending on indoor humidity (for constant pressure drop). However, despite the important developments of the associated devices (inlets, outlets, fans) towards the required energy performance, DCV and envelope airtightness improvements have led to less resilient DCV systems in terms of IAQ performance.

In France, DCV strategies are designed using multi-zone modeling tools and assumptions on occupancy, pollutant emissions and climate as well as evenly distributed leakage around the building envelope. In several predefined cases for each zone, while the total extracted airflow is optimized to its minimum value, threshold values are set for: an air quality index (based on cumulative exposure to CO2); and the duration of relative humidity exceeding the value of 75%.

Assuming an evenly distributed envelope leakage might be a strong hypothesis as in real cases uneven distributions usually occur. In order to estimate the impact of this assumption, some additional simulations have been made and presented at the AIVC 2018 Conference (Faure et al. 2018). The study considered randomly distributed envelope leakages keeping the building airtightness constant. One hundred simulations were performed changing only the envelope leakage distribution. Two humidity based DCV systems were studied for two different types of dwellings. While evenly distributed leakage led to conformed results, up to 60% of the other studied cases (randomly distributed leakage) resulted in indoor air quality indicators exceeding the threshold values at least in one zone.

Two major conclusions can be drawn from this study: 1) Energy performance based approaches have led to DCV systems extremely sensitive to envelope leakage distribution, and 2)Since the efficiency of DCV systems depends on leakage distribution which is not possible to control, DCV systems have only a few chances to meet the threshold value for IAQ.

Note: *This article is based on a paper presented at the AIVC 2018 conference (Faure et al.2018). The full paper will be available on AIVC's AIRBASE in March 2019.*



IAQ index vs zone external leakage (Faure et al. 2018).

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Partners

Product news as provided by our partners

Aeroseal sealing demonstration in Sophia-Antipolis

Following the TAAC meeting on the 20th of September, TightVent partner Mez-Aeroseal set up a small ductwork system at ADEME offices and sealed it. The technology is able to reduce leakages in air duct systems in average by 90%. Aeroseal technology closes the gap between wish and reality in terms of highly efficient air duct systems. To reach air tightness class C or D in an installed system is finally possible and approvable for complete ventilation systems in existing buildings and new constructions. Please follow the links (EN, DE, FR) to specify Aeroseal.

Retrotec's 400 DucTester Gains CE Compliance, Company Expansions in Europe

Retrotec's Model 400 DucTester is changing the industry as a handheld, lightweight, commercial duct tester. Recent work with G&M Compliance to evaluate, test and certify compliance with UL, CE and IEC standards has given Retrotec the ability to sell the product worldwide with the confidence of knowing the product meets the adopted standards and practices.

The completion of European CE Compliance testing coincidentally coincides with Retrotec's announcement of Retrotec EU, a new Netherlands-based headquarters. The expansion signals Retrotec's continued growth throughout Europe and acts as an improved method for serving European customers & supporting Retrotec Resellers and Distributors who serve the building performance industry. In addition, local calibration chambers remove the need for Blower Doors & DucTesters to be sent to North America. More information at: www.retrotec.com

BlowerDoor's DG-1000

The success story of the new DG-1000 is going on: Seven languages are now available to the user, the units to display the air flow are individually selectable. The new tubing assistant will ensure the proper connections in all situations, such as operating your BlowerDoor devices from outside the building, the tubing assistant will give you all information to connect your devices correctly. Its accurate readings, the high resolution touch screen, the intelligent micro-processor and many more fantastic features make the DG-1000 pressure and flow gauge an invaluable tool for anyone in the building performance industry. Get your DG-1000 now to benefit from the full range of features: www.blowerdoor-unlimited.com

Press Contact: Andrea Doll
BlowerDoor GmbH
MessSysteme für Luftdichtheit
Zum Energie- und Umweltzentrum 1
D-31832 Springe-Eldagsen
Tel. +49 (0)5044 975-45/
e-mail: doll@blowerdoor.de /
www.blowerdoor.de/

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