TightVent Europe
BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM

May 2021

Newsletter No 20

Foreword

Welcome to the TightVent Europe May 2021 newsletter! We hope this issue finds you healthy and well during this challenging period.

In this edition of our bi-annual newsletter you will find information and links on major TightVent events (past and upcoming), newly released publications, news from the TightVent Airtightness Association Committee (TAAC) and its activities, as well as news from our partners. Moreover, this issue includes a summary of the recently presented PhD thesis “Impact of the wind during a building air leakage measurement” by Adeline Mélois (Cerema, France).

Please visit our website, follow us on twitter and LinkedIn and subscribe to our monthly newspaper "Energy Efficiency and Indoor Climate in Buildings" to find out more about our activities. We wish you a pleasant reading!

The TightVent team

[POSTPONED] 41st AIVC – ASHRAE – IAQ – 9th TightVent & 7th venticool joint Conference

[**COVID-19 update**] Because of COVID-19 uncertainty of conditions to hold a face-to-face conference in Athens in September 2021, ASHRAE and AIVC decided to postpone the conference and reschedule it for 2022.

The conference “IAQ 2020: Indoor Environmental Quality Performance Approaches Transitioning from IAQ to IEQ”, organized by ASHRAE and AIVC, will be held in Athens, Greece. The conference will also be the 9th TightVent and 7th venticool conference.

Indoor Air Quality (IAQ) has been the core of ASHRAE’S IAQ series of conferences for the past 30 years. This conference will expand from Indoor Air Quality to Indoor Environmental Quality (IEQ). IEQ includes air quality, thermal comfort, acoustics, and illumination and their interactions. The particular focus of this conference is on performance approaches including the metrics, systems, sensors and norms necessary to implement them.

Conference topics: Health and Well-being: Appropriate technical and operational definitions; Performance Metrics: For all aspects of IEQ; Interactions: Interactions between IEQ parameters; Occupant Behavior: How behavior impacts IEQ and how IEQ impacts behavior - psychological dimensions of IEQ; Smart Sensors and Big Data: Sensor properties, data management, cybersecurity, applications; Smart Controls: Equipment properties, commissioning, equivalence; Resilience and IEQ: Responding to climate change and disasters; Ventilation: Mechanical, passive, natural and hybrid systems; Air Tightness: Trends, methods and impacts; Thermal Comfort: Dynamic approaches, health impacts and trends; Policy and Standards: Trends, impacts, implications; Role of ventilation and building airtightness in epidemic preparedness; Filtration and disinfection options to control COVID19; Face-covering impacts on indoor air quality; HVAC and IEQ in a post-COVID world

Keynote Speakers: Philomena Bluyssen, Professor of Indoor Environment, TU Delft; Richard de Dear, Ph.D., Director, Indoor Environmental Quality Laboratory, University of Sydney; Mariana Figuiero, Director of the Lighting Research Center, Rensselaer Polytechnic Institute; Dr. Benjamin Jones, Associate Professor, University of Nottingham; Cath Noakes, PhD, FIMechE, FIHEEM, Professor of Environmental Engineering for Buildings, University of Leeds; Stephanie Taylor MD, M Architecture, CIC, FRSPH(UK), MCABE, Taylor Healthcare Consulting, Inc.

More information on the new dates for the postponed conference and the development of a revised planning schedule for the papers will follow soon. You can also visit https://www.ashrae.org/conferences/topical-conferences/indoor-environmental-quality-performance-approaches or contact hblauridson@ashrae.org.

In this issue

TightVent Europe
BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM

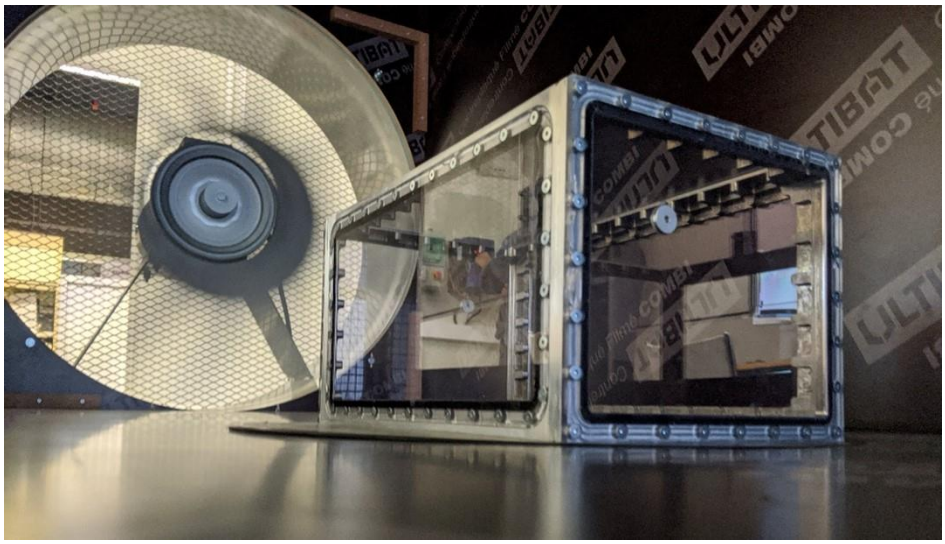
Impact of the wind during a building air leakage measurement

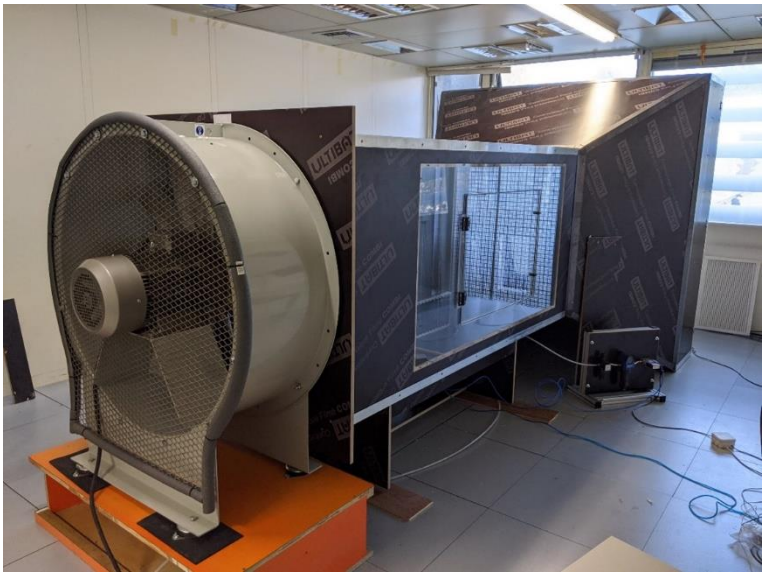
Adeline Mélois (BPE research team, Cerema, France) defended her PhD thesis on 11th December 2020 entitled "Impact of the wind during a building air leakage measurement". The Jury was composed of Arnold Janssens (Ghent University), Christopher Wood (University of Nottingham), Amina Meslem (Université de Rennes), Alain Bastide (Université de La Réunion), Valérie Leprince (PLEIAQ), Mohamed El Mankibi (ENTPE, Supervisor), François Rémi Carrié (ICEE, Supervisor) and Bassam Moujalled (Cerema, Co-supervisor). "Thanks to" the Covid19 crisis, more than 95 participants around the world were connected to the PhD defence.

To reach the nearly zero energy building level for new buildings, minimizing and controlling envelope air leakage has become one of the major levers to reduce the energy use in buildings. It is then crucial to perform reliable building airtightness measurements. Nevertheless, windy conditions during fan pressurization tests, which is the most commonly used test method and is described by the standard ISO9972, may strongly impact the test results and then lead to significant errors. As these errors are yet not well qualified and quantified, this thesis aims at characterizing the error induced by a steady wind during building air leakage measurements through laboratory experiments on a reduced model in a wind tunnel.

The analysis of 219,000 onsite tests performed on French buildings leads to the identification of factors that can significantly impact the envelope airtightness, such as the nature of the main construction material, the technique of thermal insulation, and the ventilation system, and levers to improve the practices of stakeholders and testers. Whereas many fields are included in the national database, we have very poor information regarding the uncertainty of the measurement results and thus their reliability. Our evaluation of the current knowledge regarding airtightness test uncertainty shows that several sources of error lie in the measurement itself whereas numerous sources are linked to the flow model. As no holistic approach proposes a global qualification and quantification of these errors, there remains a considerable need for research to assess the uncertainty of a test, including exploratory theoretical and experimental work.

Thus, we designed and constructed an experimental facility to reproduce pressurization tests on a reduced scale during steady wind conditions, under laboratory controlled conditions. We first present the physical model of a test we developed to conduct a dimensional analysis, leading to the definition of similarity conditions between reduced scale and full scale. Secondly, we present the design characteristic of our facility that includes a model of a simplified single-zone house with two leaks (scale 1/25th), a pressurization device with an airflow controller, and a 4.11 m long wind tunnel. We then analyse 96 pressurization tests we performed according to ISO 9972 on our facility, which include 864 measurements under steady conditions: for nine configurations of leakage distribution of our model and under eight different wind speeds (from 0 to 7 m s^{-1}). We





observed that the variation of the zero-flow pressure difference induced by strong winds depends on the leakage distribution: from 1 Pa to more than 16 Pa, which indicates that the zero-flow pressure difference is not always a relevant indicator of the windy conditions. The error due to wind we evaluated for these strong wind speeds depends on the leakage distribution, especially for the 4 Pa indicator q4, with a maximal error varying from 2% (leaks equally distributed) to 35% (60% of the leakage on the windward facade). We tested alternative analysis methods that yet did not provide more reliable results. Nevertheless, many other analysis methods should be tested from these experimental data, and many new data should be obtained using this experimental facility, leading hopefully to more reliable protocols for building airtightness tests.

See also: Link with a short video (in French):
https://www.cerema.fr/fr/actualites/ma-these-au-cerema-impact-du-vent-mesure-etancheite-air

TAAC news

The TightVent Airtightness Association Committee (TAAC) meets 4 times per year. During the last two meetings on December 17th, 2020 & April 8th, 2021 the group's discussions focused on various building airtightness related issues i.e., test methods, durability, databases etc. with presentations from:

- Theodoros Sotirios Tountas (FUV, GR), on the situation of building airtightness in Greece.
- Barry Cope (ATTMA, UK) on ATTMA's Building Performance Hub & iOS Testing Application.
- Bassam Moujaled (Cerema, FR) on in-situ measurements performed in the Durabilit'air project.
- Nolwenn Hurel (PLEIAQ, FR) on the inspection of ventilation systems comparing existing protocols in Europe and the US.
- Luke Smith (Build Test Solutions, UK) on UK's regulation adoption of the low-pressure pulse test method developed in Nottingham University.
- Irene Poza Casado (University of Valladolid, Spain) on residential buildings airtightness databases and setups in Europe and North America.
- Valerie Leprince (INIVE, FR) on the impact of wind on the result of the airtightness test, based on the AIVC Ventilation Information Paper 41: Impact of wind on the airtightness test results, published in March 2021.

The Air Infiltration & Ventilation Centre (AIVC) in collaboration with TightVent and TAAC are currently looking into the possibility to develop a European database on building airtightness as well as a template to compare how building airtightness is considered in European regulations. Work is in progress.

In case you are interested to obtain further information and/or join us, please send us an email at:

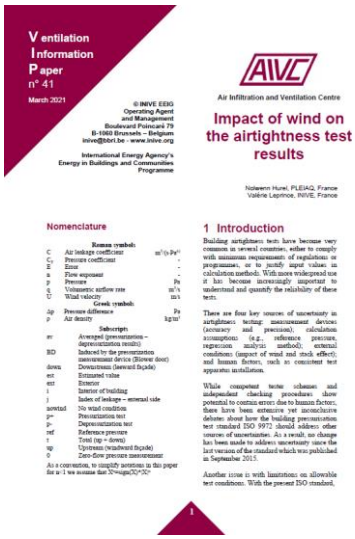
info@tightvent.eu

New release! AIVC Ventilation Information Paper 41: Impact of wind on the airtightness test results

The Air Infiltration & Ventilation Centre has just released Ventilation Information Paper no 41: Impact of wind on the airtightness test results.

This paper aims to present and discuss the calculation method of standard ISO 9972 regarding the uncertainty induced by wind; gather published knowledge and determining what further research is needed on the quantification of the wind impact on airtightness tests results (including numerical simulations, laboratory and on-site measurements studies) and; give guidance for minimizing and better estimating the wind impact on airtightness tests results.

Please click here to download and read the document.



Recordings & Slides available

The recordings and the slides of the AIVC -TightVent webinars: "Better Quantifying and Locating Building Leakages" held on November 30th, 2020 and "Building airtightness improvements of the building stock-Analysis of European databases" held on January 19th, 2021, are now available online at:

https://www.aivc.org/event/30-november-2020-webinar-better-quantifying-and-locating-building-leakages and

https://www.aivc.org/event/19-january-2021-webinar-building-airtightness-improvements-building-stock-analysis-european

The full collection of past events' recordings and slides can be found at:

https://www.aivc.org/events/webinars

Check them out and subscribe to our YouTube channel to receive our latest video updates!

TightVent Europe

BUILDING AND DUCTWORK AIRTIGHTNESS PLATFORM

Partners

Product news as provided by our partners

New air tightness testing device MEZ-DUCT-TESTER 321

The new air tightness testing device MEZ-DUCT-TESTER 321 is used to determine the amount of air leakage and the air tightness class achieved in accordance with DIN EN 16798-3 or DIN EN 1507 and DIN EN 12237, especially in ventilation and air conditioning systems. An air tightness test on air handling systems is necessary to verify compliance with the required air tightness class and thus the air tightness of the duct system. Tighter air ducts enable energy savings. Furthermore, leaky systems can lead to hygienic impairments. Missing air volumes at the destination (due to leakages) can have a negative effect on the room conditions.

BlowerDoor's Digital pressure gauge DG-1000

With the current firmware, the digital pressure gauge DG-1000 now additionally receives a logger function for long-term recording of data. Depending on the selected measurement interval (1 - 300 seconds), the DG-1000 records pressure differences over a period of 80 days up to several months. In this way, external influences on buildings caused by wind and thermal can be analyzed or building pressure differences generated by a mechanical exhaust air system or a ventilation system with heat recovery can be tested. Further applications are the measurement of pressure differences of individual ventilators in kitchens or bathrooms, the long-term recording of pressure differences in clean rooms or the determination of the flow direction of leakages.

More information at www.blowerdoor.com.

Soudal SoudaFrame SWI: intelligent pre-frame system

With SoudaFrame SWI, Soudal has developed a robust, durable and user-friendly pre-frame system for the installation of exterior joinery. SoudaFrame is made of GFRP (Glass Fibre Reinforced Plastic), a very strong and resilient material with excellent thermal performance. This Passive House certified system is quick, easy and safe to install and offers opportunities for replacing (circular construction). In combination with the appropriate SWS products, SoudaFrame SWI ensures a qualitative installation and an airtight & rainproof sealing of all joints. On the free Soudal BIM platform (http://bim.soudal.com the desired SoudaFrame pre-frame system can be downloaded as a BIM-object or loaded directly into a Revit design, after which it can be edited with the Soudal configurator.

More information? Visit www.soudalairtight.com

Introducing Retrotec's SmartCloth™ Wind Dampening Blower Door Cloth

The Answer to Wind Issues in the Field.
Despite the ubiquity of the wind problem when performing a blower door test, no manufacturer has offered an adequate solution. Until now. Retrotec's SmartCloth™ is a true industry breakthrough. The new design makes it possible to get a more accurate BIAS pressures in windy conditions. This provides advantages over the traditional methods of placing the reference tube outside on the ground.

- Test in windy conditions
- Keep tubing free of water
- No longer accidentally place tubing too close to the fan, which can cause the manometer to read flow velocities

Visit www.retrotec.com or contact us at salesEU@retrotec.com or +31 (0) 522 282941 for more information. More information: info@blowerdoor.com

DIAMOND PARTNERS

Lindab

mez technik AIR SYSTEM PRODUCTS

retrotec airflow systems since 1980 www.retrotec.com

GOLD PARTNERS

BlowerDoor GmbH MessSysteme für Luftdichtheit

eurima European Insulation Manufacturers Association

SOUDAL

SILVER PARTNERS

gonal driving air

SIGA 1966

ASSOCIATE PARTNERS

BPIE

Covenant of Mayors for Climate & Energy

PLATFORM FACILITATOR

INIVE