



# Newsletter

## Air Infiltration and Ventilation Centre



## Foreword

The 42<sup>nd</sup> AIVC Conference, is only a few days away. We are looking forward to meeting you all! On 4 & 5 October 2023, the 43<sup>rd</sup> AIVC– 11<sup>th</sup> TightVent – 9<sup>th</sup> venticool annual joint conference, will be held in Copenhagen, Denmark.

In between these major events, the AIVC will be organizing quite a few webinars so visit our website or subscribe to our mailing list and stay informed.

The past few months have been really productive regarding the development and release of new publications, so read on to see what's new.

Unfortunately, we also have sad news to communicate. We were informed that François Rémi Carrié passed away on September 11, 2022. The article in the newsletter commemorates him and his legacy.

We wish you a pleasant reading and look forward to seeing you in our future events. We would also like to encourage you to visit our [website](#), follow us on [twitter](#) and [LinkedIn](#) and subscribe to our monthly newspaper "[Energy Efficiency and Indoor Climate in Buildings](#)".

Arnold Janssens & Peter Wouters, Operating Agents, AIVC



*no 22*  
September 2022

## Feedback from the 41<sup>st</sup> AIVC - ASHRAE IAQ joint conference in Athens, Greece

The 41<sup>st</sup> AIVC – ASHRAE IAQ joint Conference, co-organized by ASHRAE & AIVC, was held on 4-6 May 2022 in Athens. The conference was held together with the 9<sup>th</sup> TightVent and 7<sup>th</sup> venticool conference. The event drew around 185 participants (in person and remotely) – academic researchers, engineering and consulting firms, industry representatives, people involved in standardisation, policy makers, manufacturers & stakeholders and international organizations.

During the event, the topical session “**Ventilative Cooling to Reduce Overheating in Buildings to Achieve Good Well-Being: Framing, New Design Approaches and Cases – It Works!**” took place. The session focused on ventilative cooling and its importance and showed documented case studies; new developments were revealed. The session highlighted also the aspects to be aware of to get a well-performing ventilative cooling system and some recommendations.

The session “**Impact of Building and Ductwork Airtightness on Indoor Environmental Quality: What Do We Know, What Do We Need?**”, aimed at discussing the impact of building and ductwork airtightness on Indoor Environmental Quality (IEQ). The objective of this session was to discuss the research needed in the field of building and ductwork airtightness and have a better view on their impact IEQ.

The session “**Better Quantifying and Locating Building Leakages**” dealt with the location and quantification of building air leakages. The objective of this session was to present and discuss new methods to quantify building leakages.

A summary of the session focusing on ventilative cooling can be found [here](#).

A summary of the sessions on airtightness are available [here](#).

## In this issue

### Foreword

Feedback from the 41<sup>st</sup> AIVC - ASHRAE IAQ joint conference in Athens, Greece

4 - 5 October 2023 – 43<sup>rd</sup> AIVC - 11<sup>th</sup> TightVent - 9<sup>th</sup> venticool conference in Copenhagen, Denmark

5 - 6 October 2022 – 42<sup>nd</sup> AIVC - 10<sup>th</sup> TightVent- 8<sup>th</sup> venticool conference in Rotterdam, Netherlands

15 November 2022, Webinar – Dumb buildings with smart users? Linking building performance & human well being

AIVC's latest publications

In memory of François Rémi Carrié

ISIAQ/IEQ-GA podcasts

AIVC List of Board Members



# Air Infiltration and Ventilation Centre

## 4-5 October 2023 – 43<sup>rd</sup> AIVC - 11<sup>th</sup> TightVent - 9<sup>th</sup> venticool conference in Copenhagen, Denmark

The 43<sup>rd</sup> AIVC conference will be held on 4 & 5 October 2023 in Copenhagen, Denmark together with the 11<sup>th</sup> TightVent conference and the 9<sup>th</sup> venticool conference. The conference will take place at Aalborg University Copenhagen Campus.

More information will follow so stay tuned.

## 5-6 October 2022 – 42<sup>nd</sup> AIVC - 10<sup>th</sup> TightVent - 8<sup>th</sup> venticool conference in Rotterdam, Netherlands

The 42<sup>nd</sup> AIVC conference: "Ventilation Challenges in a Changing World" will be held in the city of Rotterdam, the Netherlands together with the 10<sup>th</sup> TightVent and the 8<sup>th</sup> venticool conferences on October 5-6, 2022.

The conference will consist of 3 parallel sessions largely devoted to: Smart ventilation, Indoor Air Quality (IAQ) and health; Building and ductwork airtightness; and Ventilative cooling – Resilient cooling. The conference will consist of a mixture of: Well prepared and structured sessions focused on the conference topics; Presentations upon invitation; Presentations from the Call for papers; and 90 seconds industry presentations.

The conference is an initiative from 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), and venticool (the international platform for ventilative cooling); and TNO.

Detailed information on registration is available [here](#).

Detailed information on the conference programme is available [here](#).

For more information, please visit the [conference website](#).

## 15 November 2022, Webinar – Dumb buildings with smart users? Linking building performance & human well being

The transition to climate neutrality has a large impact on the job of building and HVAC designers, manufacturers, installers, investors, etc. Renovating our building stock to make it more energy efficient is a huge task. Both research and practice prove that users have an important impact on this performance. Human-building interactions, like window opening, thermostat and solar shading usage, affect the performance of the building and HVAC systems. However, achieving climate neutrality is not only about the performance of (dumb) buildings, but also about promoting comfort and wellbeing of (smart) users. This webinar wants to link building performance to human wellbeing. We will introduce you into cognitive buildings, let you rethink comfort and show how you can include user satisfaction.

This series of webinars is organized by INIVE with the support of the international Active House Alliance (AHA), and the venticool platform, and in cooperation with the Air Infiltration and Ventilation Centre.

### Programme (Tuesday, November 15<sup>th</sup>, 2022 15:30-17:00 (CET))

- 15:30 | Welcome & Introduction to venticool/AIVC - Active House, Hilde Breesch, KU Leuven/venticool, BE & Yves Lambert, Renson/Active House Alliance, Belgium
- 15:40 | Rethinking comfort within human-building resilience, Marcel Schweiker, Universitätsklinikum Aachen, Germany
- 15:55 | Cognitive buildings & active houses, Marco Imperadori, Politecnico di Milano, Italy
- 16:10 | An occupant voting system for continuous feedback, Donya Sheikhan, Ramboll, Denmark
- 16:25 | Active House Comfort score, Bas Hasselaar, DGMR, Netherlands
- 16:40 | Questions and answers
- 17:00 | End of the webinar

For further information please follow this [link](#).

## AIVC's latest publications

The AIVC is pleased to announce the release of 4 new AIVC publications!

**AIVC's Technical Note no 70: 40 years to build tight and ventilate right: From infiltration to smart ventilation** (September 2022).

This report focuses on the main technical areas of AIVC's involvement during the past 40 years.

**AIVC's Technical Note no 71: Durability of building airtightness** (September 2022).

This report presents a comprehensive review of studies that deal with building airtightness durability. It identifies key elements that may drive airtightness variations. Furthermore, the report gives the pros and cons of various alternatives to define a protocol of product assemblies concerning airtightness. Finally, this report stresses the importance of implementation conditions on airtightness durability, whose impact can be studied both on site and in laboratory.

**AIVC's Ventilation Information Paper no 45.1: Trends in building and ductwork airtightness in Estonia** (July 2022).

This paper summarizes current knowledge on trends in building and ductwork airtightness in Estonia.

**AIVC's Ventilation Information Paper no 45.2: Trends in building and ductwork airtightness in Spain** (September 2022).

This paper summarizes current knowledge on trends in building and ductwork airtightness in Spain.

All documents are freely accessible [here](#).

ANNEX 5

EBC

**AIVC Technical Note 70**  
40 years to build tight and ventilate right:  
From infiltration to smart ventilation  
September 2022

Editors

Walter de Gooijer, Netherlands, NL

Walter de Gooijer, USA, USA

Contributing authors

Walter de Gooijer, Netherlands, NL

Walter de Gooijer, USA, USA

Adrian Janssens, Ghent University, BE

Christophe Lecomte, Ghent, BE

Van Wazer, LBN, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA

Walter de Gooijer, USA, USA



# Air Infiltration and Ventilation Centre



## In memory of François Rémi Carrié

AIVC received the sad news that our dear colleague and friend Rémi Carrié passed away on September 11, 2022, after a long illness. Rémi has contributed immensely to the AIVC throughout his professional life. His death represents a great loss for the building science community.

He was a pleasant, kind, thoughtful, courteous and modest person and a consummate professional. Working with him was always a pleasure and all of us share a great respect and gratitude for his inspirational work over the years.

Rémi was a Haitian, born in Bagdad, who grew up in Afghanistan & Cape Verde. At the age of 7, he came to France and got the French nationality. He completed his engineering studies in ENTPE-Lyon where he met his wife, Nicole. They moved together to California to do their PhDs at Berkeley. Some years later they had their two daughters, Hanaé and Philaé.

He dedicated the first decade of his professional career to work on the impact and the reduction of air leaks in ductwork. He did both the theoretical and experimental investigation of aerosol deposition on slot and joint-type leaks, which eventually led to him sharing the process patent used by a company of 200 employees. (He loved

differential and dimensionless equations being one of the few people able to understand these at a glance.) He came back to France, as a researcher at ENTPE, but still doing round-trips to Berkeley to work with his team there.

After that, his efforts focused on raising awareness on the importance of ductwork airtightness in Europe, and in 2000 he was a key partner of the Save Duct project “duct leakage in European buildings status and perspectives”. The graph showing a comparison of ductwork airtightness performance in France, Belgium and Sweden had been the primary reference for almost 20 years on this topic. Later on, the Airways project was launched providing design guidance for efficient air duct systems and bringing to light the energy saving opportunities in parallel with health, safety and comfort issues.

In 2002, he became head of the “building” division at CETE de Lyon, and he was immediately acknowledged by his team as leader. Indeed, his scientific knowledge and his kindness were unquestioned. In CETE de Lyon, he extended his work to the impact of building and ductwork airtightness, not only on energy use, but also on airflow patterns, indoor air quality and acoustics. He was also a partner of the European project Asiepi.

He also worked on “shelter in place” strategies to protect people, living close to industrial plants, against accidental toxic releases. He and his colleagues developed a calculation tool and an air tightness measurement protocol to develop those shelters.

Once the importance of building airtightness was recognized, he started to work on how to implement good building airtightness (Minifil project). He and his colleagues developed technical details to help craftsmen implement building airtightness.

As one of his major achievements, he made mandatory air tightness tests happen in the French regulation RT2012. Not only was he the leader of the working group that implemented the requirement in the regulation, but he developed the quality framework for airtightness testers and for the implementation of airtightness. He also made sure that every test performed by a

qualified tester is recorded at a national database.

In 2011, he left the French ministry for construction, created his own company (ICEE) to become a consultant for INIVE. While in this position, he disseminated the importance of air tightness all over Europe, through the AIVC events and the Qualicheck project. He also created the Tightvent Airtightness Association Committee, which gathers experts in the field. He produced multiple publications to compare energy policies, standards and regulations regarding building and ductwork airtightness to promote and improve air tightness tests.

In the meantime, he got involved in the standardization process as the convenor of the working group “Inspection” of the technical committee “Ventilation”, following the motto of the AIVC “build tight, ventilate right”. He was also involved in the huge standardization process following the EPBD directive and the mandate M480, with the task of reviewing EN 16798-7 and EN 16798-17.

Starting in 2015, he dedicated his skill in Mathematics and Python to better understand and reduce the uncertainty in building fan pressurization tests. He also served as PhD supervisor and even in sickness he continued his research with his last publication only a few months ago in Energy and Buildings, which is a masterpiece.

He is the author and co-author of no less than 76 publications on the AIVC Airbase and 22 publications in peer-reviewed journals. Not only has he made great scientific achievements, but he also gave birth to “professional kids”. He contributed at world scale to reduce buildings’ energy use and improve indoor air quality, the great challenges of today's world.

Rémi has left us, but his scientific legacy won't and we will make sure his research continues to be useful.

We will all miss him dearly.



# Air Infiltration and Ventilation Centre

## ISIAQ/IEQ-GA podcasts

The Indoor Environmental Quality Global Alliance IEQ-GA and ISIAQ (International Society of Indoor Air Quality and Climate) have partnered with Healthy Indoors® / IAQNET LLC to create a unique video show and podcast – Indoor Environments: Global Research to Action – exploring how research can be translated to practice on a variety of topics related to our built indoor environments. This monthly program is hosted by Healthy Indoors' publisher, Bob Krell, and IEQ-GA president, Donald Weekes.

Links to the video recordings of all available episodes are listed below.

- [Episode-1](#) focuses on the indoor environmental quality in schools, with guests Pawel Wargocki and Froukje van Dijken
- [Episode-2](#) focuses on how the quality of water may be adversely affecting our indoor environments, with guests David Krause
- [Episode-3](#), with Charles Weschler and Glenn Morrison, looks at how occupants themselves affect our indoor environments
- [Episode-4](#), with Cheri Marcham discusses the ACGIH Bioaerosols Book, 2nd Edition, and the ACGIH Bioaerosols Committee's Activities
- [Episode-5](#), with Karen Dannemiller and Brandon Boor, discusses indoor exposure to chemicals and microbes via dust and resuspension
- [Episode-6](#), with Marwa Zaatari and William Bahnfleth, discusses an indoor air quality paradigm shift
- [Episode-7](#), with Nicola Carslaw, discusses air pollution chemistry in the indoor environment
- [Episode-8](#), was LIVE in Nashville, TN for the AIHce 2022 Conference & Expo on May 23-25, 2022 with interviews from Ken Martinez & Michele Twilley
- [Episode-9](#), with Corinne Mandin, Martin Täubel & Ulla Haverinen-Shaughnessy, was live from Finland at the Indoor Air 2022 event
- [Episode-10](#), on Architectural Acoustics features Prof. Gary W. Siebein
- [Episode-11](#), Personalized Environmental Control Systems (PECS) features Bjarne Olesen

More information can be found [here](#).

## AIVC • List of board members

Australia: Mat Santamouris, University of New South Wales • Riccardo Paolini, University of New South Wales

Belgium: Hilde Breesch, KU Leuven • Samuel Caillou, BBRI

China: Guoqiang Zhang, Hunan University • Zhengtao Ai, Hunan University

Denmark: Bjarne Olesen, Technical University of Denmark • Alireza Afshari, Danish Building Research Institute, Aalborg University

France: Laure Mouradian, CETIAT • Gaëlle Guyot, CEREMA

Greece: Dimitris A. Charalambopoulos, ASHRAE Hellenic Chapter • Alkis Triantafyllopoulos, ASHRAE Hellenic Chapter

Italy: Lorenzo Pagliano, Politecnico di Milano

Ireland: Simon Jones, Aereco • Marie Coggins, NUI Galway

Japan: Takao Sawachi, Building Research Institute • Yoshihiko Akamine, NILIM

Netherlands: Wouter Borsboom, TNO

New Zealand: Manfred Plagmann, BRANZ

Norway: Kari Thunshelle, SINTEF Byggforsk

Republic of Korea: Yun Gyu Lee, Korea Institute of Construction Technology

Spain: Pilar Linares Alemparte, The Eduardo Torroja Institute for Construction Science - CSIC • Sonia García Ortega, The Eduardo Torroja Institute for Construction Science - CSIC

Sweden: Jan-Olof Dalenbäck, Chalmers University of Technology

UK: Benjamin Jones, University of Nottingham • Maria Kolokotroni, Brunel University London

USA: Andrew Persily, NIST • Iain Walker, LBNL

### Operating agent

INIVE EEIG, [www.inive.org](http://www.inive.org), [info@aivc.org](mailto:info@aivc.org)

Arnold Janssens and Peter Wouters, operating agents • Maria Kapsalaki, senior consultant • Stéphane Degauquier

### AIVC board guests

Francis Allard • Willem de Gids • Laszlo Fulop • Zoltan Magyar • Max Sherman • Hiroshi Yoshino

### Representatives of organisations

Takao Sawachi, IEA EBC, [www.iea-ebc.org](http://www.iea-ebc.org)

Pawel Wargocki, IEA EBC Annex 78, <https://annex78.iea-ebc.org/>

Peter Holzer, IEA EBC Annex 80, <http://annex80.iea-ebc.org/>

Jelle Laverge, IEA EBC Annex86, <https://annex86.iea-ebc.org/>

Carsten Rode, IEA EBC Annex 86, <http://annex86.iea-ebc.org/>

Jaap Hogeling, REHVA, [www.rehva.eu](http://www.rehva.eu)

Donald Weekes, IEQ-GA, <https://ieq-ga.net/>

Jan Hensen, IBPSA, [www.ibpsa.org](http://www.ibpsa.org)

Ben Hughes, IJV, <https://www.tandfonline.com/loi/tjov20>