



Newsletter

Air Infiltration and Ventilation Centre

Foreword



Welcome to the AIVC September 2020 newsletter!

We hope you are keeping safe and healthy during this challenging period.

This edition of our bi-annual newsletter includes information on upcoming and past events, recent publications, our involvement and collaboration with the recently approved IEA-EBC annex 86 and a focus article on the importance of ventilation in the COVID-19 context.

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".

Peter Wouters, Operating Agent AIVC

13 -15 September 2021 – 41st AIVC - ASHRAE IAQ joint conference in Athens, Greece

After careful consideration by the Steering Committee and from input by authors, ASHRAE and AIVC have decided to postpone the conference, which was initially scheduled for September 14-16, 2020 in Athens, Greece.

The conference "IAQ 2020: Indoor Environmental Quality Performance Approaches Transitioning from IAQ to IEQ", is being postponed by one year to September 13-15, 2021 as a face-to-face conference 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. The Steering Committee has decided to make environmental impacts of COVID19 a part of the conference. See the Topics list below. Because of the postponement, a new call for submissions has been opened. Already accepted abstracts and submitted papers will be kept valid for the new conference dates.

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-**NEW** • Filtration and disinfection options to control COVID19-**NEW** • Face-covering impacts on indoor air quality-**NEW** • HVAC and IEQ in a post-COVID world-**NEW**

Call for new abstracts & papers

• Submission of new abstract: **December 21, 2020** • Notification of decision of abstract: February 15, 2021 • Submission of complete manuscript: April 19, 2021 • Final paper acceptance: June 14, 2021.

For more information, please visit:

<https://www.ashrae.org/conferences/topical-conferences/indoor-environmental-quality-performance-approaches>

or contact: hblauridson@ashrae.org



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The importance of ventilation in the COVID-19 context

Jaap Hogeling, Involved in IEG-GA and REHVA Taskforces on Covid-19

COVID-19 and the third route, are ventilation systems able to reduce the risk of contaminated aerosols? Do we need to reconsider the current ventilation rates?

As ventilation professionals, we care for the indoor environment, the health and comfort for our clients, who are the people using buildings where they spend more than 80% of their time.

We know that ventilation requirements vary around the globe. National regulations and national and international standards include different target values. They may not differ very much but what they have in common is that minimising the infection risk was never the primary basis for these requirements, with an exception of medical facilities and designated laboratories.

If we restrict the discussion to buildings designed for just human occupancy and the required level of fresh air supply via our ventilation¹ systems as included in international standards on indoor environmental input parameters like ISO 17772-1:2017 and EN 16798-1:2019², these are mainly based on the perceived air quality. This is restricting the discussion to the criteria for indoor environment that are set by human occupancy and normal emission rates of substances expected in these types of buildings. Focusing on the perceived air quality is calculated using the design ventilation rate from two components: (a) ventilation to dilute/remove pollution from the occupants (bio effluents) and (b) ventilation to remove/dilute pollution from the building and systems.

It is clear that the ventilation systems we design and operate in buildings for human occupancy are based on comfort requirements (perceived air quality) very often using the CO₂ concentration as

human tracer, taking humidity and indoor emissions of some chemicals into account. The given ventilation rates are not based on the possible virus transmission via aerosols in the air. The potential to get infected by aerosols containing viruses was never considered by setting the target values. Currently we do not know dose effect relationship of the virus, and it is difficult to prove that these aerosols contain active viruses. This last issue seems now clearer. In the New York Times Dr. Lednický revealed that "We can grow the virus from air — I think that should be the important take-home lesson"³. This is supporting the importance of the 3rd route.

The REHVA Taskforce on Covid-19 took this third infection route via aerosols very seriously in the guidance paper published August 3rd see:

www.rehva.eu/activities/covid-19-guidance.

The REHVA Taskforce summarises this as follows: New evidence on SARS-CoV-2 airborne transmission and general recognition of long-range aerosol-based transmission has developed recently. This has made ventilation measures the most important engineering tool in the infection control. While physical distancing is most important to avoid a close contact, the risk of an aerosol concentration and cross-infection over longer distances (1.5 m onward) due to an infected person can be reduced with adequate ventilation and effective air distribution solutions.

Ventilation improvement in existing or new buildings brings the question: is more outdoor air ventilation needed to reduce the risk of cross-infection? Infection risk is currently not addressed in general ventilation standards as design criterion. On the other hand, cross-infection risk is well known and applied in the design of hospital buildings where it leads to ventilation with a 6-12 air change per hour (ACH) rate. Hospital ventilation systems have worked well in COVID-19 conditions as cross-infections have been under control, thus illustrating that high capacity ventilation is capable to keep

aerosol concentration at low level. In non-hospital buildings, there are evidently lower emission rates and smaller numbers of infected persons per floor area. So, a lower ventilation rate than in hospitals could be considered as a starting point for the risk reduction.

Concluding: Yes, increase of ventilation rates will help to reduce the infection risks. Since this not likely to be the last epidemic we will encounter, we should reconsider the basis of our ventilation standards to take into account the ventilation needs during a pandemic.

Notes:

¹ "Ventilation is the process by which 'clean' air (normally outdoor air) is intentionally provided to a space and stale air is removed. This may be accomplished by either natural or mechanical means" AIVC (2020). Frequently Asked Questions. "What is ventilation?" (<https://www.aivc.org/resources/faqs/what-ventilation>)

² ISO 17772-1:2017 Indoor environmental input parameters for the design and assessment of energy performance of buildings

EN 16798-1:2019 Energy performance of buildings - Ventilation for buildings - Part 1: Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics

³ "A Smoking Gun: Infectious Coronavirus Retrieved From Hospital Air". New York Times 11 August 2020 (<https://www.nytimes.com/2020/08/11/health/coronavirus-aerosols-indoors.html>)



Air Infiltration and Ventilation Centre

IEA EBC annex 86 on “Energy Efficient Smart IAQ Management for residential buildings”

Jelle Laverge, IEA EBC annex 86 operating agent

This new annex was approved in June 2020. The goal of Annex 86 is to propose an integrated rating method for the performance assessment and optimization of energy efficient strategies of managing the indoor air quality (IAQ) in new and existing residential buildings. This integrated performance assessment will accelerate the development of better and more energy efficient IAQ management strategies to address rapidly changing expectations of the home environment due to challenges such as peak oil, climate change or pandemics.

To achieve this, we are gathering the existing scientific knowledge and data on pollution sources in buildings, looking at the opportunities that spring from the rise of IoT connected sensors, studying current and innovative use cases of IAQ management strategies and developing road maps to ensure the continuous performance of the proposed solutions over their lifetime.

In the annex, experts from different fields including mechanical engineering, building science, chemistry, data science and environmental health work together with other stakeholders towards consensus on the basic assumptions that underlie such a performance assessment and develop practical guidelines and tools to bring the results to practice.

The annex is now in its 1-year preparation phase and will start its 3-year operation phase in June 2021. The 6-monthly expert meetings will be held in connection with the AIVC conferences and events to limit travel, provided in-person meetings are possible. In the other case, a series of short conference-calls and webinars will be organised.

We currently have participants from Austria, Belgium, Chile, China, Denmark, France, Ireland, New Zealand, Switzerland, the UK and the USA. We actively invite all other IEA-EBC member countries to participate. A minimum commitment of 3 person-months of labour in

research activities relevant for the annex for each year of the Annex term will be required for participation, as well as a commitment to participate in the expert meeting. Interested research groups / companies can contact the operating agent (jelle.laverge@ugent.be) or their country representative in the IEA-EBC Executive Committee (<https://www.iea-ebc.org/contacts>).

AIVC May 2020 Webinar Recordings available!

In May 2020, the Air Infiltration and Ventilation Centre (AIVC) together with the Oslo Metropolitan University (OsloMet) and SINTEF Community organized a series of 3 webinars under the theme of "Urban Home Ventilation" to provide insights from national and international experiences in the field.

The total number of people attending the webinars was 795. 231 people attended the Kitchen Ventilation webinar; 240 people attended the Moisture control webinar; 324 people attended the Ventilation requirements trends and thermal comfort webinar.

The recordings and the slides of these webinars are available online. Please click on the links below to view the recordings and download the slides.

1. Part 1: Kitchen Ventilation | Recordings and Slides available at:

<https://www.aivc.org/event/6-may-2020-webinar-kitchen-ventilation>

2. Part 2: Ventilation requirements, trends and thermal comfort | Recordings and Slides available at:

<https://www.aivc.org/event/13-may-2020-webinar-ventilation-requirements-trends-and-thermal-comfort>

3. Part 3: Moisture Control | Recordings and slides available at:

<https://www.aivc.org/event/19-may-2020-webinar-moisture-control>

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

<http://aivc.org/resources/collection-publications/events-recordings>.

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

AIVC's latest publications

In May 2020 the AIVC released 2 new Literature List Publications focusing on “Ventilative Cooling” & “Building and Ductwork Airtightness”.

AIVC Literature List 34 "Ventilative Cooling" includes:

- papers & slides presented at AIVC & venticool annual conferences and publications produced during the operation of IEA-EBC annex 62;
- slides presented at workshops organized with the collaboration of venticool & IEA-EBC annex 62; and
- recordings from webinars organized with the collaboration venticool & IEA-EBC annex 62.

AIVC Literature List 35 “Building & Ductwork Airtightness” includes:

- papers & slides presented at AIVC & TightVent Europe annual conferences and publications produced in collaboration with AIVC & TightVent Europe,
- slides presented at workshops organized with the collaboration of AIVC, TightVent Europe & the QUALICheck platform, and
- recordings from webinars organized with the collaboration AIVC, TightVent Europe & the QUALICheck platform.

Access to the publications is free upon registration. Please use the links provided below to download the documents:

<https://www.aivc.org/resource/II-34-ventilative-cooling-2020-edition>

<https://www.aivc.org/resource/II-35-building-ductwork-airtightness-2020-edition>



International Energy Agency
Building & Ductwork Airtightness
AIVC Literature List 35
2020 edition

Energy in Buildings and Communities Programme
May 2020

International Energy Agency
Ventilative Cooling
AIVC Literature List 34
2020 edition

Energy in Buildings and Communities Programme
April 2020



AIVC is a component of the International Energy Agency (IEA)





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Healthy Buildings 2021 Europe & America

The International Society of Indoor Air Quality and Climate (ISIAQ) is delighted to announce the opening of the Call for Abstracts and Workshop Proposals for next summer's twin conferences Healthy Buildings 2021, to be held in two locations, Europe and America, in June and August respectively, with a shared International Summer School.

The American conference, Healthy Buildings 2021 - America, will be a face-to-face conference with virtual content, hosted in a spacious convention centre in Honolulu, Hawaii, and hosted by the Cleaning Industry Research Institute (CIRI).

The European conference, Healthy Buildings 2021 - Europe, is planned to cater for either virtual or face-to-face attendance in Oslo, with a social programme that makes maximum benefit of the summer solstice. Co-organizers are Oslo Metropolitan University (OsloMet), SINTEF Community, and The Norwegian University of Science and Technology (NTNU) and is endorsed by AIVC and REHVA.

The conference will play host to multiple trending topics, including 4 important D's: Disease (post CoViD19 indoor environments) – urban Dwellings (IAQ, IEQ, climate adaptation) – Digitization (smart controls e.g. demand-control, optimization) — and Decarbonization (efficient HVAC solutions, emissions, rehab towards EU 2050 and circular economy).

More information can be found at:

European conference homepage:
<http://www.hb2021-europe.org/>

American conference homepage:
<http://www.HB2021-America.org/>



**HEALTHY
BUILDINGS
EUROPE 2021**

AIVC • List of board members

Australia: Mat Santamouris, University of New South Wales • Wendy Miller, Queensland University of Technology

Belgium: Arnold Janssens, University of Ghent • 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: François Durier, CETIAT • Nicolas Doré, ADEME

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 Byggeforsk

Republic of Korea: Yun Gyu Lee, Korea Institute of Construction Technology • Jae-Weon Jeong, Hanyang University

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

Sweden: Paula Wahlgren, Chalmers University of Technology • Pär Johansson, Chalmers University of Technology

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

USA: Andrew Persily, NIST • Max Sherman, LBNL

Operating agent

INIVE EEIG, www.inive.org, info@aivc.org

Peter Wouters, operating agent • Maria Kapsalaki, senior consultant • Stéphane Degauquier

AIVC board guests

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

Representatives of organisations

Takao Sawachi, IEA EBC, www.iea-ebc.org

Jaap Hogeling, REHVA, www.rehva.eu

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

Jan Hensen, IBPSA, www.ibpsa.org

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

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 68, <https://www.iea-ebc-annex68.org/>

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