Towards high quality, low-carbon ventilation in airtight buildings

AIVC International Workshop
Tokyo, Japan
18-19 May 2023

Workshop description

NILIM and BRI of Japan, together with the Air Infiltration and Ventilation Centre (AIVC) organise a workshop entitled "Towards high quality, low-carbon ventilation in airtight buildings" to be held on 18-19 May 2023 in Tokyo, Japan.

The 2-day workshop provides the opportunity to Japanese researchers and engineers, as well as international experts visiting Japan, to present and discuss recent developments in relation to ventilation and airtightness. The workshop is organized in 5 thematic sessions.

In the opening session, a representative of the ministry in charge of Japanese policies toward zero carbon buildings in 2030 and 2050 will describe the latest concrete policy measures including energy efficiency. Latest evolutions in regulations and standards on energy performance and ventilation in Europe and the US will also be presented.

In the session for IEA EBC Annexes (international collaborative R&D projects), which are relevant to ventilation, latest outputs from 1) technologies for gas-phase air cleaning (Annex 78), 2) side-by-side management methods of indoor air quality and energy efficiency (Annex 86) and 3) personalized environmental control system technologies (Annex 87) will be presented.

An airtight building envelope is essential especially in order to avoid heat loss due to air leakages. In non-residential buildings, in addition to wind and stack effects, air pressure caused by HVAC systems may worsen the heat loss due to the air leakages. However, it seems that effective techniques for improving the airtightness in non-residential buildings have not yet been shared enough among Japanese building engineers and researchers. Some existing approaches in Europe, North America and Japan and future perspectives for standardisation will be discussed in the airtightness session.

In the session on approaches to search for more energy efficient and reliable ventilation systems, the latest standards for testing heat recovery effectiveness in laboratories will be reviewed with test examples, in which key characteristics of products influential on the actual effectiveness have been demonstrated. Characteristics of the Japanese market of energy recovery ventilators and improvements in the latest products will be analyzed. Performance assessment of other energy efficient ventilation strategies and smart ventilation is also discussed.

In the session on the role of ventilation in infection control, a Japanese government proposal in July 2022 on effective ventilation to avoid infections by large aerosol and small floating aerosol diffusion will be reviewed with some actual infection case studies. Also, the characteristics of aerosol transmission route of respiratory pathogens and their mitigation strategies will be discussed by building physics researchers, who have been collaborating with medical experts in the committee dedicated to the Japanese infection control strategies. Other presentations discuss new developments in ventilation standards and regulations, and advances in measurement techniques.

Programme

Day 1 – Thursday May 18th 2023		
Opening Chairs: *Takao Sawachi (BRI), Peter Wouters (INIVE)*		
09:00	Welcome on behalf of NILIM	Takahiko Hasegawa (Deputy Director-General, NILIM, JP)	
09:10	Welcome on behalf of BRI and overview of IEA-EBC	Takao Sawachi (EBC Executive Committee Chair, JP	
09:20	Overview of AIVC, TightVent, venticool & IEQ-GA	Arnold Janssens (AIVC Operating Agent/INIVE/UGent, BE)	
09:30	Context and policies for energy, climate, ventilation in Japan	Takashi Imamura (Housing Bureau-MLIT, JP)	PDF
09:55	The context and policies for energy and ventilation in Europe, new evolutions in EPBD	Jaap Hogeling (EPB-Center/REHVA/ISSO, NL)	PDF
10:20	Ventilation standards/regulations in the US	Iain Walker (LBNL, USA)	PDF
10:45	**Break**		
IEA-EBC Annexes Chairs: *Hilde Breesch (KU Leuven), Kazuhide Ito (Kyushu University)*		
11:15	A general overview of IEA-EBC Annex 78: Supplementing ventilation with gas-phase air cleaning, implementation and energy implications	Pawel Wargocki (DTU, DK)	PDF
11:30	International standardization of testing perceived air quality and the supporting information from in silico model for transport efficiency of acetone from indoor to olfactory epithelium cells	Kazuhide Ito (Kyushu University, JP)	PDF
11:55	An update on IEA-EBC Annex 86: Energy efficient smart IAQ management in residential buildings	Jelle Laverge (UGent, BE)	PDF
12:10	Dallying with DALYs: a harm-based approach to IAQ acceptability	Benjamin Jones (Nottingham University, UK)	PDF
12:35	**Break**		
13:35	IEA-EBC Annex 87: Energy and indoor environmental quality Performance of Personalised Environmental Control Systems (PECS)	Bjarne Olesen (DTU, DK)	PDF
13:50	Personal environment comfort system (PECS) for improving thermal comfort and IAQ in a zero energy building	Shin-ichi Tanabe (Waseda University, JP)	PDF
14:15	Discussion		
Quality assurance of ventilation and heat recovery systems Chairs: *Alireza Afshari (Aalborg University), Masaki Tajima (Toyohashi University of Technology)*		
14:35	Actual effectiveness of energy/heat recovery ventilators in buildings: how is it influenced by key design factors and testing results (airflow, airflow ratio, unit exhaust air transfer ratio)?	Tetsutoshi Kan (Better Living, JP)	PDF
15:00	Latest trends and technologies of energy recovery ventilators in Japan	Junichi Takahashi (Mitsubishi Electric co, JP)	PDF
15:25	**Break**		
15:55	Performance assessment framework for smart ventilation systems	Hilde Breesch (KULeuven, BE)	PDF
16:20	Effect of indoor temperature differences and zoning on the performance of energy efficient ventilation strategies for domestic buildings	Jelle Laverge (UGent, BE)	PDF
16:45	Discussion		

17:05	**End of Day 1**

Day 2 – Friday May 19ᵗʰ 2023			
Airtightness			
Chairs: *Yu Wang (Branz), Hiroshi Yoshino (Tohoku University)*			
09:00	Proposals for future activities to promote Airtightness in non-residential buildings in Japan	Kiyoshi Hiwatashi (Taisei Corporation, JP)	PDF
09:25	Trends in building and ductwork airtightness in different countries	Valérie Leprince (Cerema, FR)	PDF
09:50	Airtightness testing of large buildings	Iain Walker (LBNL, USA)	PDF
10:15	Measurement for exterior wall airtightness of high-rise buildings using stack effect/individual air conditioning and outdoor air entering through entrance doors	Yuichi Takemasa (Kajima Technical Research Institute, JP)	PDF
10:40	**Break**		
11:10	Airtightness of large buildings in Japan: current situation and a proposal for the future	Takashi Hasegawa (Eikan-Shoji, JP)	PDF
11:35	ISO 9972: An overview of difficulties with the current standard	Benedikt Koelsch (Cerema, FR)	PDF
12:00	Durability of building airtightness	Valérie Leprince (Cerema, FR)	PDF
12:25	Discussion		
12:45	**Break**		
Role of ventilation in infection control			
Chairs: *Valérie Leprince (Cerema), U Yanagi (Kogakuin University)*			
13:45	Aerosol transmission route of respiratory pathogens and their mitigation strategies	U. Yanagi (Kogakuin University, JP)	PDF
14:10	Countermeasures against indoor aerosol infection in Japan	Motoya Hayashi (Hokkaido University, JP)	PDF
14:35	Measurement of virus concentrations: recent developments (pre-recorded presentation)	Chris Iddon, (UCL, UK)	PDF
15:00	Revision of ISO17772-1 and EN16798-1 Standards dealing with indoor environmental quality	Bjarne Olesen (DTU, DK)	PDF
15:25	**Break**		
15:55	Role of air cleaning in infection control	Pawel Wargocki (DTU, DK)	PDF
16:20	Developing regulations to improve IAQ and ventilation in Belgian buildings	Peter Wouters (INIVE, BE) and Arnold Janssens (UGent, BE)	PDF
16:45	Airtightness and internal air flows in multifamily buildings	Iain Walker (LBNL, USA)	PDF
17:10	Discussion		
17:30	Conclusions		
17:45	**End of Day 2**		

Organisers

The workshop is organized by **NILIM** and **BRI** together with the Air Infiltration and Ventilation Centre (**AIVC**) and facilitated by **INIVE** (International Network for Information on Ventilation and Energy Performance).

Language

English will be the official language. No translation is foreseen.

Cost

Participation to the workshop is free but requires you to register for the event. **Participation is possible in person or online**. In case of no-show after registering as in person participant, a penalty of €100 will however be charged.

Registration

To register, please fill in the registration form available at: https://forms.gle/ErfmjSCG6H8RbSXr6.

Note: Online registration will close on Friday May 12th at 12:00PM CET. After this you can register via email to: aivc2023tokyo@iibh.org

Venue

The workshop will take place at Bellesalle Mita Garden (3-5-19 Mita, Minato-ku, Tokyo/Tokyo Mita Garden Tower 2F (Room B+C).

Enquiries

For further information, please contact: aivc2023tokyo@iibh.org