

Joint Conference
33rd AIVC Conference and 2nd TightVent Conference

**Optimising Ventilative Cooling and Airtightness for
[Nearly] Zero-Energy Buildings, IAQ and Comfort**

Programme (status October 2, 2012)

Wednesday 10 October 2012

8.30 Registration and welcome coffee

9.15 – 10.45 Opening session

- General welcome and launch of VentiCool platform (Peter Wouters, Manager INIVE, Belgium)
- CPH2025 Climate Plan – An opportunity for innovation and creation of green growth (Mette Margrethe Elf, Director of Environmental Department, City of Copenhagen, Denmark)
- Round table discussion : Finding the right balance between energy conservation, indoor air quality and comfort in future energy efficient buildings (Lone Feifer, Velux A/S, Denmark – Claus Bugge Garn, Rockwool International A/S, Denmark – Lars-Ake Mattsson, Lindab Ventilation, Sweden – Kirsten Engelund Thomsen, SBi, Denmark)

10.45 – 11.15 Coffee break

11.15 – 12.45 Combined session – Ventilation and infiltration challenges

- Ventilative Cooling in Residences – the need, potential and challenges (Per Heiselberg, Aalborg University, Denmark)
- Energy performance regulations of low energy buildings: challenges linked to airtightness and ventilative cooling (Jean-Christophe Visier, CSTB, France)
- Health and indoor air quality challenges (Marie-Eve Heroux, WHO, Germany)

12.45 – 13.45 Lunch break

13.45 – 15.15 Parallel Session 1A – Long oral presentation session – Assessment and potential of ventilative cooling

- Long term monitoring of residential heat recovery ventilation with ground heat exchange (Bart Cremers, Netherlands)
- Human preference and acceptance of increased air velocity to offset warm sensation at increased room temperatures (Giulio Cattarin, Italy)
- Intelligent energy consumption in low energy housing (Anders Hof Christensen, Denmark)
- Strategies for controlling thermal comfort in a Danish low energy building: system configuration and results from 2 years of measurements (Peter Foldbjerg, Denmark)
- Natural ventilation strategy potential analysis in an existing school building (Laura Lion, Italy)
- Ventilated courtyard as a passive cooling strategy in the hot desert climate (Mohamed Hssan Hassan, Egypt)

13.45 – 15.15 Parallel Session 1B - Long oral presentation session – IAQ and energy impacts of envelope leakage

- Transfer of ultrafine particles and air in multi-storey buildings (Amalie Gunner, Denmark)
- Air Leakage of US Homes: Regression analysis and Improvements from Retrofit (Max Sherman, USA)
- Lessons learned on ventilation systems from the IAQ calculations on tight energy performant buildings (Xavier Boulanger, France)
- Influence of improvement of air-tightness on energy retrofit of social housing, a Case Study in a Mediterranean Climate (Jesica Fernandez-Agüera, Spain)
- Blower door tests of a group of identical flats in a new student accommodation in the Arctic (Carsten Rode, Denmark)
- An Investigation of the Relationship between Dwelling Permeability, Operational Adventitious Air Leakage, and Winter Space Heating Demand (Benjamin Jones, UK)

13.45 – 15.15 Parallel Session 1C – Topical session ‘European Policies on Indoor Air Quality’

Synopsis: The last decade a set of actions has promoted research activities aimed at broadening the knowledge-base of IAQ and, by doing so, at supporting the decision-making process in Europe. The objectives of the Topical session on "European Policies on IAQ" are to: (a) make an overview of the main research activities supported by the EU framework programmes, (b) demonstrate how an EU wide assessment of the IAQ related burden of disease can be effectively done by integrating full chain risk modelling and (c) review and identify challenges of existing and future policies on energy and IAQ in buildings and climate change. At the end of the session, experiences and views on how to improve the translation of the IAQ knowledge-base into effective measures will be shared and research needs in Europe will be discussed.

- EU funded projects and actions on Indoor Air Quality in FP6 and FP7: major outcomes and future challenges for the European policy (Lara-Grazia Passante & Stylianos Kephelopoulou, European Commission)
- Integrating full chain risk modeling with European IAQ-BoD assessment (INTERA platform with IAIAQ update) (Matti Jantunen, Finland)
- Policies on Energy and IAQ in Buildings and Climate Change (Eduardo de Oliveira Fernandes, Portugal)
- Plenary discussion

15.15 – 15.30 Room change

15.30 – 16.30 Parallel Session 2A – Short oral presentation session – Characterization of ventilative cooling strategies and ventilation system performance

- Towards the aerodynamic characterization of roof windows ? (Bruno Peuportier, France)
- Air turbulence intensity influence on the thermal comfort evaluation for different ventilation strategies (Cristiana Croitoru, Romania)
- Reducing energy consumption in an existing shopping centre using natural ventilation (Jannick Karsten Roth, Denmark)
- Façade-Integrated Ventilation Systems in Nordic Climate (Matthias Haase, Norway)
- Overflow elements : Impacts on energy efficiency, indoor air quality and sound attenuation (Gabriel Rojas Kopeinig, Austria)
- Numerical prediction of the air exchange in the museum premises equipped with natural ventilation systems (Andrzej Baranowski, Poland)
- Construction and Set-up of a Full-Scale Experimental House for ventilation studies (Manfred Plagmann, New Zealand)
- Update of the Spanish regulation regarding ventilation and infiltration: analysis, comparisons and repercussions (José Manuel Salmeron Lissen, Spain)
- RANS and LES models comparison for a cross-shaped jet flow with application in personalized ventilation (Florin Bode, Romania)
- Experimental evaluation for the dynamic insulation applied to window frame (Shinsuke Kato, Japan)
- Applicability of air supply type airflow window system applied to double-pane window (Sihwan Lee, Japan)
- A multi-criterion method for examining the health and energy impacts of air change rates in dwellings (Payel Das, UK)

15.30 – 16.30 Parallel Session 2B – Topical session ‘Ductwork airtightness’

Synopsis: Scandinavian countries have a long experience with the implementation of quality ductwork systems. This session will give an overview of the instruments developed in Sweden to urge proper design, installation and maintenance of ductwork systems. We will also discuss how this inspires other countries.

- Swedish experience with air tightness testing: overall scheme, test protocol, and practical (Johnny Andersson, Sweden)
- Recent steps to stimulate ductwork airtightness in the French regulation and the Effinergie+ label (Benoît Golaz, France)
- Open discussion

15.30 – 16.30 Parallel Session 2C – Topical session ‘Health-Based ventilation Guidelines for Europe (HealthVent project) ‘

Synopsis: At present ventilation standards and guidelines define ventilation rates in non-industrial buildings to meet comfort requirements of building occupants. It is reasonable to enquire what should the ventilation rates be if they are based on health requirements. This is one of the goals of the HealthVent project attempting to define health-based ventilation guidelines for Europe. The purpose of this session is to communicate and discuss the results obtained so far by the project team.

- Principles of health-based ventilation guidelines (Pawel Wargocki, Denmark)
- Evidence on ventilation effects on health (Paolo Carrer, Italy)
- Impact of ventilation on energy requirements (Hugo Santos, Portugal)
- Health impact of the HealthVent guidelines (Otto Hanninen, Finland)
- Implementation of the guidelines, current ventilation standards and qualitative HealthVent guideline (Olli Seppänen, European organization)
- Discussion

16.30 – 17.00 Room Change and coffee break

17.00 – 18.30 Parallel Session 3A - Topical session ‘Ventilative cooling in building standards and regulations)’

Synopsis: Energy performance regulations and related standards have undoubtedly become key market drivers. This is a specific concern for ventilative cooling strategies as they require rather mature assessment methods for thermal comfort and ventilation losses to be correctly accounted for. The purpose of this session is to discuss methods and standards relevant to ventilative cooling strategies as well as their implementation in energy performance regulations.

- Ventilative cooling: an illustration of the holistic approach on buildings and systems (Jaap Hogeling, Netherlands)
- Natural ventilation and passive cooling is not any more a privilege of experts (Flourentzos Flourentzou, Estia)
- Adaptive thermal comfort requirements in EN 15251 and ASHRAE standards 55 (Atze Boerstra, BBA Indoor Environmental Consultancy)

17.00 – 18.30 Parallel Session 3B – Topical session ‘Quality and building airtightness’

Synopsis: Improving building airtightness represents a great challenge for the building industry because it entails profound changes in design and site implementation as well as on the overall building process. This session will address specifically testing and site implementation issues, with a focus on the quality frameworks that have been developed or that are under development.

- Overview of operational competent testers schemes for building airtightness (Rémi Carrie, Belgium)
- The FliB certification scheme for craftsmen (Oliver Solcher, Germany)
- Proposal for an updating French regulation concerning airtightness measuring equipments’ calibration (Florent Boithias, France)
- Overview of selected training initiatives in France (Andrès Litvak, France)
- Open discussion

18.30 End of the first day

Thursday 11 October 2012

08.45 – 10.15 Parallel Session 4A – Topical session ‘Ventilative cooling in residences’

Synopsis: With the increased insulation and airtightness levels in new and renovated buildings summer comfort has become an important challenge in residences. The session will address summer comfort requirements and design methods as well as the potential of ventilative cooling.

- Implications of infiltration for high performance dwellings (Fergus Nicol, UK)
- Simplified hourly method to calculate summer temperatures in dwellings (Lone Hedegaard Mortensen, Denmark)
- Addressing summer comfort in low-energy housings using the air vector: a numerical and experimental study (Axel Cablé, France)
- Summer Comfort by Night Flush Ventilative Cooling : Potentials, Limitations and Design Implementations (Peter Holzer, Austria)

08.45 – 10.15 Parallel Session 4B – Short oral presentation session – Airtightness of buildings

- French policy for Shelter-in-place : Airtightness measurements on indoor rooms (Gaëlle Guyot, France)
- Effect of Measurement Location of Air Air-tightness Performance on Apartment Units in Korea (Shin Cheol Woong, Korea)
- Optimal sizing rules for natural, simple exhaust and mechanical residential ventilation systems (Jelle Laverge, Belgium)
- Checking “fabric first” really works: in-construction tests using thermography (Tim Taylor, UK)
- Lessons learnt from the regulatory quality management scheme in France (Sarah Juricic, France)
- Air leakage characteristics of dwellings in high-rise residential buildings in Korea (Yun Jeong Choe, Korea)
- Assessment of the airtightness and air exchange in polish dwellings – measurement experiences and problems met (Joanna Ferdy-Grygierek, Poland)
- Best practice window installation (Stefan Tenbuss, Germany)
- Energy Retrofit of the Existing Housing Stock in England (Hasim Altan, UK)

08.45 – 10.15 Parallel Session 4C – Topical session ‘Is VOC the right answer to demand controlled ventilation? (Clear Up project)’

Synopsis: The aim of this session is to discuss the relevance to control the ventilation airflow rate provided to a building based on the actual needs and more specifically using volatile organic compounds sensors.

- Demand specifying variables and current ventilation rate requirements with respect to the future use of VOC sensing for DCV control (Jakub Kolarik, Denmark)
- New developments in VOC sensing for DCV (Simone Herberger, Germany)
- Ventilation strategies based on VOC sensing (Bruno Illi, Switzerland)
- General discussion

10.15 – 10.40 Coffee break

10.40 – 12.10 Parallel Session 5A – Topical session ‘International initiatives on ventilative cooling’

Synopsis: Ventilative cooling is achieving increased interest in many countries. The session presents two new initiatives to initiate and coordinate international cooperation in field. The overall goal of the platform is to increase communication, networking and awareness raising regarding a more effective implementation of ventilative cooling strategies while the focus of the Annex is to initiate and coordinate a new strong research effort.

- Presentation of the Ventilative Cooling Platform (Peter Wouters, Belgium)
- Presentation of the IEA ECBCS Annex proposal on Ventilative Cooling (Per Heiselberg, Denmark)

10.40 – 12.10 Parallel Session 5B – Topical session ‘Quality of domestic ventilation systems’

Synopsis: While it is generally accepted that a ventilation—whether natural, mechanical or hybrid—is needed to provide acceptable indoor air quality and prevent building damage, there are debates about the actual performance of these systems and how the deviations observed affect the overall buildings performance. In addition, the envelope airtightness is an important factor with respect to real ventilation system performance. In this session, we will give feedback from field campaign and practice and discuss ways to explore to improve the situation.

- Residential ventilation system performance: outcomes of a field study in the Netherlands (Atze Boerstra, Netherlands)
- Performances of ventilation systems: on site measurements related to energy efficiency, comfort and health (Samuel Caillou, Belgium)
- Airtightness and ventilation of new Estonian apartments constructed 2001-2010 (Targo Kalamees, Estonia)

10.40 – 12.10 Parallel Session 5C - Topical session ‘Ventilation and thermal comfort in school renovations (SchoolVentCool project)’

Synopsis: The currently running European SchoolVentCool project aims to examine high performance retrofit measures for schools, including prefabrication and modular design, which will promote high indoor environmental quality through improved ventilation and cooling, and in parallel will secure high energy efficiency. The purpose of this session is among others to present and discuss the solutions examined by the Danish partners in the project consortium as well as to communicate the potential economic consequences of poor air quality in classrooms.

- Thermal comfort analyses in classrooms (David Venus, Austria)
- Experimental study of diffuse ceiling ventilation in a classroom (Christian Anker Hviid, Denmark)
- Influence of different ventilation strategies on classroom temperature and air quality, and perceptions of pupils (Pawel Wargocki, Denmark)
- The performance of ventilation systems in existing schools classroom (Christian Anker Hviid, Denmark)
- Socio-economic consequences of better air quality in schools, a Danish example (Pawel Wargocki, Denmark)

12.10 – 12.20 Room change

12.20 – 13.20 Parallel Session 6A – Long oral presentation session – Airflow modelling and performance assessment

- Uncertainties in airflow network modelling to support natural ventilation early stage design (Annamaria Belleri, Italy)
- Hybrid ventilation – the ventilation concept in the future school buildings? (Jannick Karsten Roth, Denmark)
- The discharge coefficient of a centre-pivot roof window (Ahsan Iqbal, Denmark)
- Comparison of displacement ventilation and mixing ventilation systems with regard to ventilation effectiveness in offices (Michele De Carli, Italy)

12.20 – 13.20 Parallel Session 6B - Topical session ‘Philosophy and approaches for building airtightness requirements’

Synopsis: Because of the significant impact of air infiltration on energy use, there are a number of countries that have implemented measures to encourage better envelope airtightness. The purpose of this session is to give an overview and discuss the pros and cons of these approaches.

Structured discussion

12.20 – 13.20 Parallel Session 6C – Long oral presentation session – Characterization of ventilation system performance

- Exhaust ventilation under 5 ventilation standards : a performance assessment (Jelle Laverge, Belgium)
- Design of HVAC systems for deprived community houses in Yorkshire and the Humber region in the UK (Hasim Altan, UK)
- Assessment of performance of innovative ventilation systems: use and limit of multi-criteria analysis (Marc Jardinier, air-h & Laure Mouradian, France)
- Heat recovery efficiency: measurement and calculation methods (Samuel Caillou, Belgium)

13.20 – 14.15 Lunch break

14.15 – 15.30 Parallel Session 7A – Topical session ‘Advanced concepts’

Synopsis: New advanced solutions are needed to improve the effectiveness of ventilative cooling and make it a more competitive technology. The session will describe different developments to improve ventilative cooling.

- Ventilative cooling using concrete decks with PMC (Michal Pomianovski, Denmark)
- Night cooling energy balance (Jerome Le Dreau, Denmark)
- Improvement of summer comfort by passive cooling with increased ventilation and night cooling (Tommaso Pellegrini, Italy)
- Hybrid ventilation and cooling technics for the new Nicosia Townhall (Flourentzos Flourentzou, Italy)
- The influence of the selective ventilation in the thermal performance of modern naturally-ventilated houses in Goiânia – Brazil (Leônidas Albano da Silva Junior, Spain)

14.15 – 15.30 Parallel Session 7B – Long oral presentation session – Characterizing the airtightness of buildings

- A survey of airtightness and ventilation rates in post 1994 NZ homes (Stephen McNeil, New Zealand)
- Numerical evaluation of airtightness measurement protocols (Adeline Bailly, France)
- Airtightness of office and educational buildings in Sweden – measurements and analyses (Ake Blomsterberg, Sweden)
- A numerical study on the role of leakage distribution and internal leakages under unsteady wind conditions (Dimitrios Kraniotis, Norway)
- Postulate for Airtightness Limits in Large Buildings (Stefanie Rolfsmeier, Germany)
- Build Large Buildings right or suffer a life sentence of Energy, Comfort & IAQ Problems (Colin Genge, Canada)

14.15 – 15.30 Parallel Session 7C - Topical session ‘Health and comfort in highly energy efficient buildings’

Synopsis: Highly energy efficient buildings should ensure that the low use of energy does not compromise conditions for the users of buildings. This session will identify and discuss research issues that need to be prioritized to ensure that a built environment in highly-efficient energy buildings (and older buildings undergoing the energy retrofit) is safe and comfortable with no health hazards for its users neither due to poor design and construction, nor due to poor operation, maintenance or performance. The identified research issues will address broad areas related to basic human requirements, technical solutions, policies and training programmes supporting implementation.

Structured discussion

15.30 – 15.45 Room change

15.45 – 17.30 Closing session

- Summing up of ventilative cooling track (Per Heiselberg, Aalborg University, Denmark)
- Summing up of airtightness track (Arnold Janssens, Ghent University, Belgium)
- Summing up of ventilation, IAQ and health track (Willem de Gids, VentGuide, Netherlands)
- Ventilation and airtightness in mild climates, including IAQ and comfort concerns in NZEB (Servando Alvarez, University of Sevilla, Spain)
- Announcement of the 2013 Conference (Mattheos Santamouris, University of Athens, Greece)

17.30 End of the conference