venticool
the international platform for ventilative cooling

Newsletter

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Foreword

Annex 62 has been running at full speed since its official start in January 2014: the State-Of-The-Art report is completed; information from over 125 buildings is being processed to document the characteristics of ventilative cooling systems; tools are under development to assess the overheating risk and cooling needs; ways to account for ventilative cooling in building regulations are being analysed with the aim to develop recommendations for future regulations.
The project results will gradually be uploaded on http://venticool.eu/annex-62-publications/ and will be intensely discussed during the next AIVC conference on 23-24 September in Madrid.
venticool is pleased to embrace its role to disseminate Annex 62 activities with this newsletter and help bridge the gap between scientific and regulatory approaches. We wish you a pleasant reading.

The venticool team

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IEA EBC Annex 62 – Ventilative Cooling – 3rd Expert Meeting, Changsha, China, April 15-18, 2015

by Maria Kolokotroni, Brunel, UK

17 delegates from 9 countries attended the expert meeting. The host was Hunan University (Prof. Guoqiang Zhang) who in conjunction with the expert meeting also organised the “International symposium of Sustainable City and Built Environment” with about 250 attendees and 31 presentations on the state-of-the-art within the European and Chinese built environment.
At the meeting the first Annex report “Ventilative Cooling - State-of-the-art Review” was completed (see separate article in this newsletter).
The Annex is also collecting a database (goal of more than 150 case buildings) of existing ventilative cooling systems to systematically document characteristics, used technologies, typical components and control strategies depending on climate, building type, building design, etc. This work is progressing well and data input is received from 125 buildings so far. The database will be available by the end of 2015 at: http://venticool.eu/annex-62-home/

Another important topic at the meeting was the discussion of the development and evaluation of tools and methods for prediction of overheating risk and cooling need. This work has started and the initial results of tools development and evaluation was presented and discussed. Best practices in building regulations among participating countries has been collected. A proposal for a common case to be used as basis for analysis of national building regulations will be developed until the next meeting in order to compare and evaluate the different national approaches and develop recommendations for future regulations in relation to ventilative cooling.
Examples of research activities and results from Annex 62 will be presented during two sessions at the AIVC 2015 Conference in Madrid in September 2015.
The 4th Annex 62 Expert Meeting will be in Boston, US on October 12-13, 2015. The host of the meeting will be MIT (Prof. Leon Glicksman). More information will follow.

In this issue

Photos: IEA EBC Annex 62 – Ventilative Cooling – 3rd Expert Meeting, Changsha, China

IEA EBC Annex 62, Ventilative Cooling, State-of-the-Art Review completed

by Maria Kolokotroni, Brunel, UK

The state-of-the-art (SOTAR) report of ECB Annex 62 Ventilative Cooling is completed; it summarises the work of the initial working phase of the Annex and is structured in five chapters:

> Potentials and limitations, reviews existing methods suitable to estimate the cooling potential of climatic conditions considering building characteristics, outlines critical barriers to ventilative cooling and reviews thermal comfort indices.

> Ventilative cooling in existing Energy Performance Regulations, presents results of surveys through questionnaires on the treatment of ventilative cooling in national codes and standards.

> Exemplary Existing Building using Ventilative Cooling, presents twenty-six existing and operational buildings using principles of ventilative cooling. All buildings were built after 2000, are located in different climates and are of a variety of building types.

> Existing Components and Control Strategies for Ventilative Cooling, presents ventilation components, classified into guiding, enhancing and cooling, and actuators and sensors; illustrated with photographs of existing components in the market and/or as installed in operational buildings.

> Existing Methods and Tools suitable for designing ventilative cooling aspects during building design are reviewed. A table with commonly used public domain and commercial models together with some details of inputs and outputs required is given.

The review reveals that ventilative cooling is an attractive option for the reduction of energy use in residential and non-domestic buildings with materialised examples in a variety of climates. As a cooling strategy has the potential to contribute significantly to the reduction of the end use cooling energy demand. The review also reveals that in many national building codes and energy performance regulations ventilative cooling is not explicitly refer to as a cooling option. Therefore the treatment of ventilation requirements for cooling and its effect on cooling demand reduction are not clear. This has an impact on the architectural design as well as the specification of components and controls.

Recently completed project: Natural Ventilation for Energy Savings in California Commercial Buildings

by Guilherme Carrilho da Graca, University of Lisbon, Portugal

The research program investigated the potential energy savings to be gained by retrofitting non-domestic buildings in California with natural ventilation for cooling. The simplest and most cost effective retrofit is to open windows on the façade and turn off any mechanical ventilation.
The program was split into three major projects. Project 1 assessed the potential of and the barriers to the implementation of natural ventilation. Project 2 examined induced air movement and the possible ingress of outdoor pollutants. Project 3 produced new tools for predicting the energy performance of naturally ventilated buildings, and provided training in their use.
The major barriers to the introduction are the lack of specific design guidance and a lack to easy-to-use modeling tools. These are compounded by a lack of design experience and case studies and the mandatory requirements for the amount and location of openable area specified in “California Building Standards Code, Title 24”.
Research on wind-driven natural ventilation using computational fluid dynamics and wind tunnel tests provided new algorithms for cross ventilation, single-sided ventilation and corner ventilation, accounting for opening size, location and number, and the effects of sheltering by neighboring buildings. These algorithms were implemented in EnergyPlus, and the new version of the code was used in three training sessions to provide the design and engineering community with some familiarity in the new modules that calculate natural ventilation.
The overall outcome of this program was a comprehensive study of the current issues concerning retrofitting commercial buildings in California and an assessment of the potential risks and benefits. It has also significantly extended the capabilities for modeling, design, and operation of naturally ventilated buildings in California.
This recently completed (10/2014) three year project was funded by the California Energy Commission. The project was coordinated by Paul Linden (UC, San Diego) and involved UC, Berkeley, LBL, Arup and CPP Wind Engineering. The project report will be available in:
CEC Project Reports.

IEA Annex 62 cooperation opportunity

by Peter Holzer, Institute of Building Research & Innovation, Austria

Within the first phase IEA EBC Annex 62, Ventilative Cooling, running from 2014 – 2017, chances and challenges of Ventilative Cooling have been investigated.
Main challenges have been identified in the aspects of security, noise and wind protection, dust and insect protection, reliability and control schemes. Also identified has been a generally positive attitude towards Ventilative Cooling both from builders and users, leading to a need for development of new airflow guiding and enhancing components, as well as design aids.
The collected outputs of this fact finding phase of Annex 62 will be published end of June at www.venticool.eu.
Interested manufacturers are warmly invited to use this collected information and are furthermore invited to contact the Annex 62 researchers in case of specific research & development needs. The remaining operational phase of Annex 62 until end of 2016 offers a perfect chance to launch specific R&D, powered by the opportunities of a strong and truly international research program.
For further information please contact Dr. Peter Holzer (Austria), Leader of Subtask B – Solutions: peter.holzer@building-research.at

September 23-24, 2015: 36th AIVC conference, Madrid, Spain

The 36th AIVC conference: 'Effective ventilation in high performance buildings' will be held in the city of Madrid, Spain together with the 5th TightVent and the 3rd venticool conferences in September 23-24, 2015. It will be a major international event in 2015 focusing on various topics relevant to ventilative cooling, airtightness, IAQ and health, as well as compliance, smart control, and BIMs (see full list of topics on: http://aivc2015conference.org/home/scope-and-topics).
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

- The Eduardo Torroja Institute for Construction Science - IETcc-CSIC.

Registration to the conference is now open. To register online please visit http://aivc2015conference.org/registration
Programme information will follow soon so stay tuned at: www.aivc2015conference.org

September 12-14, 2016: 37th AIVC – ASHRAE – IAQ joint conference Alexandria, VA, USA

The 2016 AIVC conference will be organised in collaboration with ASHRAE. It will be held in the Crowne Plaza hotel in Alexandria (10 km from Washington DC)
The Conference title is “ASHRAE IAQ 2016 Conference – Defining Indoor Air Quality: Policy, Standards and Best Practices.”
Visit the conference website at: https://www.ashrae.org/membership--conferences/conferences/ashrae-conferences/iaq-2016
More information will follow so stay tuned at: www.aivc2015conference.org.

Save the date for the QUALICHeCK workshop on sustainable summer comfort technologies: March 9-10, 2016, Athens, Greece

Organised with support from the European Cool Roof Council, ES-SO, venticool and AIVC. More information to come on the QUALICHeCK website.

What is ventilative cooling?

Ventilative cooling refers to the use of natural or mechanical ventilation strategies to cool indoor spaces. This effective use of outside air reduces the energy consumption of cooling systems while maintaining thermal comfort. The most common technique is the use of increased ventilation airflow rates and night ventilation, but other technologies may be considered as well. Ventilative cooling is relevant in a wide range of buildings and may even be critical to realize renovated or new NZEB.

What is venticool?

venticool is the international ventilative cooling platform launched in October 2012 to accelerate the uptake of ventilative cooling by raising awareness, sharing experience and steering research and development efforts in the field of ventilative cooling.

Disclaimer

PARTNERS

- **AGORIA-Naventa** is the Belgian association of manufacturers of natural ventilation in residential and non-residential buildings. This group was founded within Agoria, the federation of the Belgian technological industry. As Naventa, we give special consideration to health-related issues when developing new natural ventilation, solar shading and night cooling systems. By supporting the venticool platform, Naventa wants to increase her knowhow and raise awareness that there is a huge need for CEN standards to calculate the influence of ventilative cooling on the energy performance of buildings..

- **ES-SO**, the European Solar-Shading Organization (ES-SO) is the umbrella body representing the European solar shading and roller shutter industry. Its objectives are to provide a permanent point of contact between its members (mainly the national professional trade associations) and the European authorities, and to demonstrate that solar shading can make a substantial contribution to energy savings and indoor comfort. By joining the ventilative cooling platform ES-SO underlines the importance of different technologies and strategies to be used in a multidisciplinary and integrated conceptual way to reach the target of low energy buildings' thermal comfort criteria as well as maintaining a good indoor climate and visual comfort .

- The **VELUX** Group offers a wide range of solutions for daylight and fresh air through the roof – regardless of roof pitch, size and purpose of the building.The VELUX Group considers ventilative cooling to be a sustainable technology. A technology which today is not at all used to its full potential. The mission of venticool is therefore crucial. It supports the effective and knowledge-based promotion of the use of ventilative cooling, it fills in the gaps in the value chain of ventilative cooling that exist in calculation methods, standards and regulations, and it promotes the communication and awareness of ventilative cooling that could act as a catalyst in the development of the right solutions for the market when they are most needed.

- **Wienerberger** is the world's largest producer of clay blocks and number one in facing bricks in Europe and the USA as well as the market leader for clay roof tiles in Europe with 214 plants in 30 countries. In an ever-evolving construction market with stricter energy, insulation and sustainability requirements for homes and buildings, Wienerberger is constantly striving towards innovation with intelligent building concepts and total solutions, attaching great importance to the aspect of sustainability in green manufacturing, construction and living.

  Our partnership with Venticool enables us to further develop and optimize the sustainable building solutions we offer to our customers. Moreover, we want to transfer knowledge to our customers (both builders, renovators and building professionals such as architects, engineering agencies, contractors, etc.) by means of theory- and practice-oriented training courses, seminars, workbooks, etc.

- **WindowMaster A/S** is founded on a vision to create better buildings that have plenty of fresh air and excellent and safe indoor climates. We supply sustainable indoor climate solutions for all types of buildings and our solutions are based on natural and hybrid ventilation. Also natural smoke ventilation is a part of our offerings. Our expertise is built on our knowledge of regulatory standards and project development, and our experience from thousands of completed projects across Europe.

PLATFORM FACILITATOR

- **INIVE** is a registered European Economic Interest Grouping (EEIG) that brings together the best available knowledge from its member organisations in the area of energy efficiency, indoor climate and ventilation.