

# Reporting on the ventilative cooling workshop held October 23, 2017, Brussels

**I**nternational workshop on “ventilative cooling in buildings: now & in the future” was attended by 62 persons from 15 countries attended. This workshop aimed at discussing the implementation of ventilative cooling as well as its role to guarantee good thermal summer comfort in commercial, educational and residential buildings. The programme firmly built on the results of IEA-EBC Annex 62:

- The ventilative cooling potential excel tool that allows to assess the effectiveness of ventilative cooling solutions taking into account climate conditions, building envelope thermal properties, occupancy patterns, internal gains and ventilation needs
- A book with design guidelines derived by the expert group which should be under review in the next weeks
- An overview of the ability of national energy performance calculation methods to properly take into account ventilative cooling solutions
- An overview of solutions and technologies that can be implemented, including lessons learnt from 15 case studies analysed within the project
- An analysis of relevant CEN and ISO standards and the identification of gaps to fill to increase the adoption of ventilation cooling solutions

The interaction with the audience after these presentations, reflected the interest and need for such tools. These tools will be gradually available on the venticool website. In the discussions, besides purely ventilative cooling solutions, appropriate solar shading was often mentioned as a pre-requisite. Several participants thought that Phase Change Materials (PCM) and personal comfort solutions (e.g., using micro-evaporators) could be major new elements influencing future design solutions. It was also acknowledged that, while ventilative cooling solutions can be effective on multiple aspects including comfort, energy use, power demand and costs, it also requires more work



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at design stage, possibly with dynamic simulations including airflow modelling, as well as more post-occupancy care, in particular to inform occupants. Several attendees also stressed the need to learn from user interaction and that “visible” automatic controls (e.g. window opening or solar shading controls) need to be understandable for user.

## Smart readiness indicator

There were debates about the objectives of the smart readiness indicator (<https://smartreadinessindicator.eu/>) to be included in the future Energy Performance of Buildings Directive. Since only its broad contours are defined at this stage, it is clearly too early to assess the relevance of a single indicator for the scope foreseen and how this could affect the uptake of ventilative cooling; however, in principle, accounting for electricity grid management and indoor climate would converge with the goal sought with ventilative cooling solutions.

## Building Information Modelling (BIM)

The development of Building Information Modelling (BIM) could also be seen as an opportunity for ventilative cooling as it could ease thermal comfort evaluation and, thereby, encourage designers to look into efficient solutions to prevent overheating. Nevertheless, the structuring of the huge amount of data to be included in BIM objects to cover possible applications, could be a serious hurdle to make this happen in the near future.

## The IEA-EBC project

This workshop was also the occasion to discuss a new IEA-EBC Annex proposal building on the findings of IEA Annex 62, but looking more broadly at the issues of smart overheating prevention and cooling in changing urban environments. The scope goes beyond the boundaries of the building, addressing also heat island mitigation and outdoor comfort, and includes active cooling as a complementary measure to passive techniques. The goal is to foster “resilient” cooling solutions, i.e., solutions that either maintain or adapt to maintain their function as outdoor temperatures rise without augmenting stress on the outdoor environment.

In summary, there is no doubt that overheating prevention and cooling will be high on political agendas with the effects of global warming, which we are just starting to experience. The workshop showed an alternative path to the generalisation of full mechanical cooling capacity implementation which would be both energy demanding and detrimental to urban heat island and the adoption of passive cooling techniques. The discussions further stressed challenges and opportunities for research and technology development on resilient cooling to fight and adapt to climate change, in a constantly evolving context of regulations and information technology. This could be the core theme of a new IEA-EBC project. ■

## Post navigation

IEA EBC Annex 62- Ventilative Cooling- 8th Expert Meeting, Gent, Belgium, October 24-25, 2017.

<http://venticool.eu/iea-ebc-annex-62-ventilative-cooling-8th-expert-meeting-gent-belgium-october-24-25-2017/>

18-19 September 2018, Conference, Juan-les-Pins, France | 5th venticool – 39th AIVC – 7th TightVent Conference, 2018.

<http://venticool.eu/18-19-september-2018-conference-juan-les-pins-france-5th-venticool-39th-aivc-7th-tightvent-conference-2018/>

# REHVA Displacement Ventilation GUIDEBOOK

Displacement ventilation is primarily a means of obtaining good air quality in occupied spaces that have a cooling demand. It has proved to be a good solution for spaces where large supply air flows are required.

Some advantages of displacement ventilation:

- Less cooling needed for a given temperature in the occupied space;
- Longer periods with free cooling;
- Potential to have better air quality in the occupied spaces;
- The system performance is stable with all cooling load conditions.

Displacement ventilation has been originally developed in Scandinavian countries over 30 years ago and now it is also a well-known technology in different countries and climates. Historically, displacement ventilation was first used for industrial applications but nowadays it is also widely used in commercial premises.

However, displacement ventilation has not been used in spaces where it could give added values. For that there are two main reasons: firstly, there is still lack of knowledge of the suitable applications of displacement ventilation and secondly, consultants do not know how to design the system.

REHVA published 2002 the first version of displacement ventilation guide. The aim of this revised Guidebook is to give the state-of-the-art knowledge of the technology. The idea of this guidebook is to simplify and improve the practical design procedure.

This guide discusses methods of total volume ventilation by mixing ventilation and displacement ventilation and the guide book gives insight of the performance of the displacement ventilation. It also takes into account different items, which are correlated, to well-known key words: free convection flow; stratification of height and concentration distribution; temperature distribution

and velocity distribution in the occupied zone and occupant comfort.

The guidebook discusses two principal methods which can be used when the supply air flow rate of displacement ventilation system is calculated:

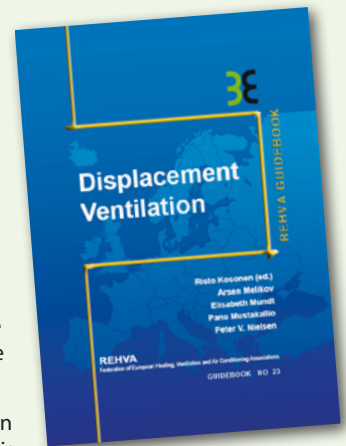
1) temperature based design, where the design criterion is the air temperature in the occupied zone of the room and

2) air quality based design where the design criterion is the air quality in the occupied zone. Some practical examples of the air flow rate calculations are presented.

The air flow diffusers are the critical factor: most draught problems reported in rooms with displacement ventilation are due to high velocity in the zone adjacent to the diffuser. This guide explains the principle for the selection of diffuser.

This guide also shows practical case studies in some typical applications and the latest research findings to create good micro climate close to persons is discussed.

These and some other aspects are discussed in this book. Authors believe you will find this guide useful and interesting when you design or develop new ventilation solutions.



REHVA Guidebook No. 23 is now available!