

AIR INFORMATION REVIEW

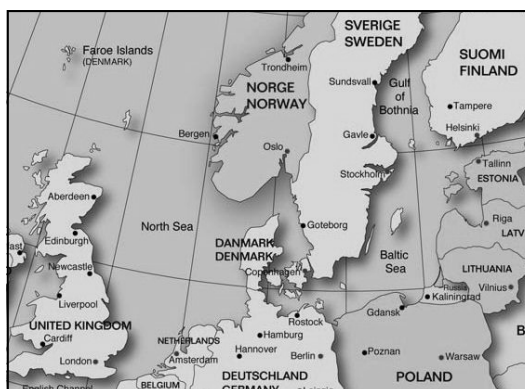
VOL 28, No. 3, June 2007

A quarterly newsletter from the IEA Air Infiltration and Ventilation Centre



Denmark, another new member country

In the March issue of AIR, we were pleased to announce that Japan and South-Korea have joined the AIVC. This time, we have the pleasure of welcoming Denmark as a new AIVC country. Denmark is one of the frontrunners in energy efficiency actions and was the first country in Europe to implement energy efficiency certificates for dwellings.



The effective follow-up of the AIVC activities will be done through the combined efforts of 2 teams: one at Aalborg University, led by Professor Per Heiselberg (who was the Operating Agent of IEA Annex 35 Hybrid Ventilation and who is the present Operating Agent of IEA Annex 44 Integrating Environmentally Responsive Elements in Buildings (http://www._____); the other team is at the International Centre for Indoor Environment and Energy at the Technical University of Denmark (http://www._____), led by its director Professor Bjarne Olesen. Both organisations have a very high profile in the area of ventilation, indoor climate and energy efficiency in buildings and we expect that their involvement will substantially increase AIVC's input.

We are also pleased to announce a formal collaboration with REHVA (http://www._____), the European Association of national HVAC associations. The idea is to set up information exchange in order to strengthen the output of REHVA and AIVC. As one of the agreed actions, REHVA will regularly provide contributions to AIR where the focus is on ventilation related topics.

Similarly, a collaboration is being set up with NCEUB, the Network on Comfort and Energy Use in Buildings (http://www._____). Among other actions, NCEUB will produce an AIVC technote and there will be regularly contributions from NCEUB to AIR. The first contributions are expected for the September issue.

Finally, we also have very sad news. Marie-Claude Lemaire, who was for many years the French representative in the AIVC died on March 30 after several years of serious health problems. Marie-Claude really contributed very actively to the AIVC activities. Our thoughts and prayers go out to her friends and family for their loss. We have really lost a friend and colleague with very high professional commitment.

Max Sherman
Chairman AIVC Steering Group

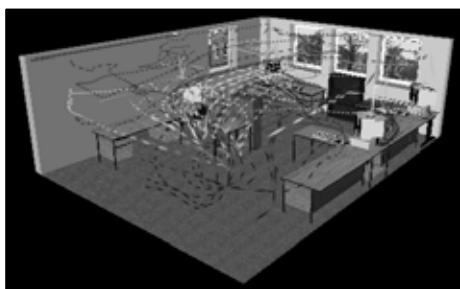
Peter Wouters
Operating Agent

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Ventilation Education in Europe

M. Kolokotroni,
Brunel University of London

The Energy Performance of Buildings Directive is being implemented in Europe. A core issue for an effective implementation is training of building professionals on the design and operation of building systems for integral energy performance and also on energy sub-systems such as ventilation. This paper describes such an initiative carried out by the Vent DisCourse project. The project had the aim of developing distance learning training material for the promotion of best practice ventilation energy performance in buildings and was funded by the Intelligent Energy – Europe Programme (IEEA); it was completed in December 2006.



*Detailed Computerised tools,
Common Resource Module*

Requirements, the market and the availability of source material

A review and evaluation of educational distance learning methods for the target audience and their application to building ventilation training material was carried out as part of the Vent DisCourse project. It concluded that there is need to improve the skills, competence and knowledge of professional engineers, but time pressure and professional responsibilities comprise a barrier to the continuing training. Distance learning material provides flexibility, independent studies, individualization, globalisation of the market, easy exchange of experience and adaptation to the new technology and legislation. A market study carried out indicated that the potential trainees are building designers (architects) and building services engineers.

A study of all applicable distance learning methodologies was carried out and concluded that the following media are appropriate for the dissemination of the knowledge on ventilation and its relevance to EPBD:

- Textbook in the form of distance learning education delivery format; this format is described in more detail in the following section and could be provided in the form of a hard copy or a CD-ROM.
- Internet-based modules; this material was based on the WebCT platform for the pilot training but could be adapted to any teaching internet platform suitable for distance learning.

The contents are based on the developed textbook and the features of the platform are utilised to facilitate interaction between trainee and tutor and between trainees.

- Continuing Professional Education articles (CPD) suitable for publication in professional journals including self assessment questions with solutions are provided.

It was also observed that trainees would require the material in their national language for better understanding. It was therefore decided to translate the developed material, which was written in English, in another language to investigate how this could be done in an accurate and time-efficient way.

It followed a study concerning the collection, evaluation and classification of the necessary information and material to develop the distance learning training material.

Available sources were identified. As the focus of this study was European engineers, a number of recently completed research and dissemination projects funded by the EU were identified (such as NatVent, STEVE, TipVent, AIOLOS, DUCT, URBVENT, SolVent, ECA) which describe new technological and legislative developments, industrial information, testing methods, predictive software and existing applications in buildings. Conclusions from international collaborative projects and recent development in countries outside the EU were also investigated (such as IEA - ECBCS Annex 35 and 27).

AIR Information Review

The newsletter of the AIVC, the Air Infiltration and Ventilation Centre. This newsletter reports on air infiltration and ventilation related aspects of buildings, paying particular attention to energy issues. An important role of the AIVC and of this newsletter is to encourage and increase information exchange among ventilation researchers and practitioners worldwide.

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Preparation: Christophe Delmotte & Peter Wouters - Editing: Erika Malu

Material published by the AIVC was consulted extensively. All of these source information was evaluated and classified according to its usefulness for the education material.

Their content was classified into nine categories, i.e.:

1. Technological developments
2. Industrial information
3. Testing methods
4. Predictive software
5. Existing applications in buildings
6. Case studies
7. Developments linked to ventilation requirements:
 - 7.1 protection of buildings (fire security, terrorism attacks),
 - 7.2 air quality and health,
 - 7.3 materials.
8. Critical barriers vs. ventilation systems.
9. Impact of double skin façade on ventilation system design.

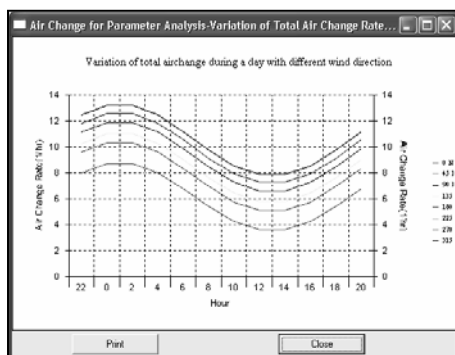
The educational material was developed using the above classification.

Structure of the developed educational material

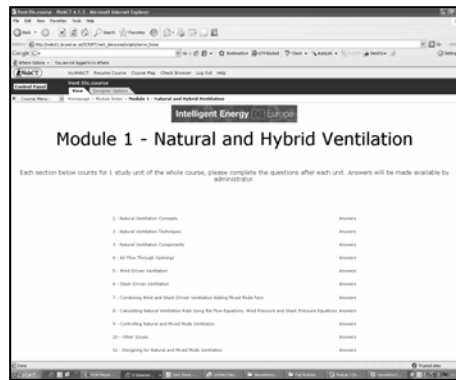
The educational material was developed in six modules, the following:

- Foundation module: Principles of energy efficient building ventilation
- Module 1: Natural and hybrid ventilation
- Module 2: Ventilation for Urban Buildings
- Module 3: Energy Efficient Mechanical ventilation
- Module 4: Assessment of Building Ventilation
- Common Resource Module

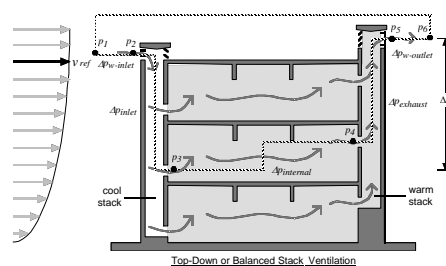
In order to address the needs of distance learning students the following principles were followed in developing each module.



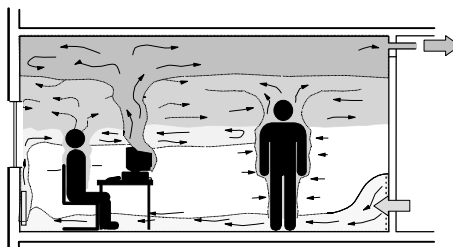
Simplified computerised tools, Common Resource module, Screen shot of parametric analysis of transient results



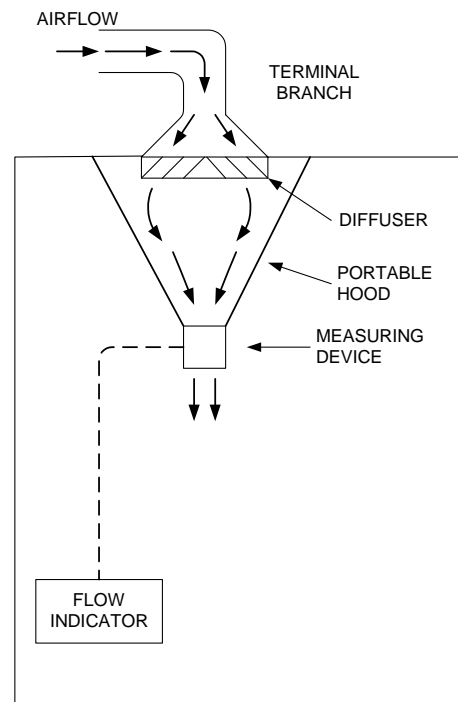
Vent Dis.Course WebCT, Web based version of the developed distance learning training material. Selection screen for Module 1 download. WebCT, Brunel University



Top down stack ventilation diagram, Module 2 Ventilation in Urban buildings



The idea behind Displacement Ventilation. Contaminated air is stratified in the upper zone of the room, and clean air supplied to the breathing zone. Module 3, Efficient Mechanical Ventilation



Flow measurement from diffusers, Module 4, Ventilation Performance

Each module is divided into sections that the students can absorb in one session (for example 2-3 hours of study). Therefore each chapter is approximately 10-12 pages long to include the following elements:

1. Chapter objectives – so those students are aware of the goals to be achieved by studying this specific section.
2. Introduction to the section.
3. 4-5 sub-sections each with some illustrations in the form of pictures or graphs and with a number of self assessment questions.
4. The self assessment questions are designed to revise the material learnt in the sub-section and the students should attempt themselves. Solutions to the personal feedback questions should be provided separately so that the students can instantly check how they work.
5. More complicated sub-section which contain key or difficult to understand principles include worked examples so that the students have a similar solutions before they attempt the corresponding personal feedback question.
6. Each section includes a summary at the end to highlight the key elements learnt while studying it.

Two assessment exercises were developed. The first tests knowledge of modules 1 and 2 and comprises of a design exercise for a notional building to follow natural and hybrid ventilation strategies. The notional building could be placed in a rural or urban site and trainees are asked to recommend suitable solutions. Material from the common resource module can be used to carry out this assignment. The second assignment tests knowledge of modules 3 and 4 and takes the form of an open book examination where trainees are asked to solve problems similar to the ones contained in the material. They are also asked to write a report for a building owner who would like to investigate some ventilation problems in his building.

Contents of educational material

The contents were first developed by the participating organisations based on published material on ventilation. AIVC resources were heavily used. A number of European Experts on ventilation commented on the first draft of the material and their comments were incorporated in a second version. This version was tested by students in six universities (Brunel, Helsinki, Athens, LaRoche, ENTPE, Prague) using distance learning principles and utilising the WebCT platform to facilitate delivery. Comments from students were implemented in the final version of the material. The material was translated into another European language (Finnish) for further training opportunities. It is intended that translation into other languages will follow, for the whole material or parts of it.

A listing of the contents of each module is included below:

- *Foundation module: Principles of energy efficient building ventilation:* Ventilation Requirements, Criteria for Ventilation Rates, Criteria for Ventilation Rates
- *Module 1: Natural and hybrid ventilation:* Natural Ventilation concepts, Natural Ventilation concepts, Natural ventilation components, Airflow through openings, Wind driven ventilation, Stack driven ventilation, Combining wind and stack driven ventilation, adding hybrid fans, Calculating natural ventilation rate using the flow equations, wind pressure and stack pressure equations, Controlling natural and hybrid ventilation, Other issues, Designing for natural and hybrid ventilation

- *Module 2: Ventilation for Urban Buildings:* Natural and hybrid ventilation in urban buildings, Impact of the urban environment on natural and hybrid ventilation, Natural ventilation strategies to enhance airflows in urban environments, Evaluation of the natural and hybrid ventilation potential in urban environments, A methodology to calculate the optimum openings for naturally ventilated buildings located in urban canyons, Performance of hybrid ventilation in urban environments through experimental data, Recommendations for the use of natural and hybrid ventilation systems in urban buildings
- *Module 3: Energy Efficient Mechanical ventilation:* Principles of mechanical ventilation, Ventilation of residential buildings, Ventilation of non-residential buildings, Ducts, Air handling units, Filters, Heat recovery, Room air distribution, Control of ventilation and air conditioning, European standard related to ventilation.
- *Module 4: Assessment of Building Ventilation:* Measuring ventilation parameters, Assessment of ventilation and comfort, Commissioning and balancing ventilation systems, Commissioning controls and sensors, Operation and maintenance, Design and construction issues
- *Common Resource Module:* Computerised Tools, Case-studies (available in a CD-ROM)

Short educational articles

In addition to the material developed for postgraduate professionals, four short articles were developed on specific topics for wider dissemination. The topics were chosen because they were indications that they would be of interest to engineers or because they cover results of recent research activities. The articles were firstly written in English and published in the REHVA journal and there are also being translated in another three languages (Greek, French and Italian) for further dissemination opportunities in national professional journals.

The articles cover the following topics and can be found at

<http://www.rehva.com>:

- Displacement Ventilation in non-industrial premises, REHVA Journal, June 2006
- Performance of Natural Ventilation in the Urban Environment, REHVA Journal, September 2006

- Assessment Of Ventilation And Comfort, REHVA Journal, December 2006
- Energy Impact of Ventilation, REHVA Journal, December 2006

Conclusions and lessons learnt

- There is a great demand for distance learning training material suitable for industrial and educational training in relation to emerging issues in energy and buildings.
- The benefits of an international group of experts preparing the text are great – this is an important way to promote good technologies over between European countries
- The format should be flexible to leave a certain amount of freedom to training providers to suit needs of target trainees.
- Textbook (print version) is the preferred method of learning for university students and industrial trainees alike. The web-based facility is preferred for selective release items such as question answers or assignments and for interactive contact with other students and/or trainer.
- Harmonisation of typically used terms and symbols in different countries and regions should be addressed early on in the development of any training material.

Vent DisCourse was coordinated by Brunel University (School of Engineering and Design, M Kolokotroni and J Shilliday), with the participation of University of Athens (Department of Applied Physics, M Santamouris and I Farrou), REHVA (Federation of European Heating and Air conditioning, O Seppanen), BSRIA Ltd (Building Services Research Industrial Association, R Brown and J Parker), ENTPE (Ecole Nationale TPE, Laboratoire Sciences de L' Habitat – CNRS-DGCB, G. Guaracino) and VEETECH Ltd (M. Liddament).

More information can be found at

<http://www.----->

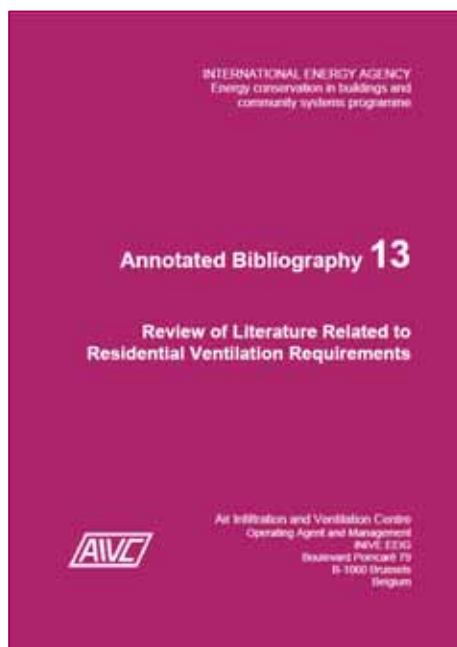
This project was co-financed by the Intelligent Energy – Europe Programme (IEEA). The sole responsibility for the content of this article lies with the authors. It does not represent the opinion of the Community. The European Commission is not responsible for any use that may be made of the information contained therein.

Review of Literature Related to Residential Ventilation Requirements

J. McWilliams, M. Sherman, Lawrence Berkeley National Laboratory

AIVC Annotated Bibliography 13, 2007, 34 pp

This annotated bibliography reviews current ventilation codes and standards for residential buildings in Europe and North America. It also examines the literature related to these standards such as occupant surveys of attitudes and behaviour related to ventilation, and research papers that form the technical basis of the ventilation requirements in the standards.



The major findings from the literature are that ventilation is increasingly becoming recognized as an important component of a healthy dwelling, that the ventilation standards tend to cluster around common values for recommended ventilation rates, and that surveys of occupants showed that people generally think ventilation is important, but their understanding of the ventilation systems in their houses is low.

[AIVC Online http://www.aivc.org/publications/Bibliography/BIB13.htm](http://www.aivc.org/publications/Bibliography/BIB13.htm)

Considerations concerning costs and benefits with application to ventilation

P. Wouters, N. Heijmans, Belgian Building Research Institute

AIVC Contributed Report 05, 2007, 54 pp

Decision makers that have to decide on which type of HVAC system has to be installed in a building will usually base their decisions on the investment and running costs (including expected maintenance costs) and their perception of the quality of the system. In general, the energy savings will be compared to a reference (less efficient) system to calculate the benefit.

However, the choice of the building equipment has also an impact on the Indoor Environmental Quality (IEQ) and on the performance of the workers inside the building. This is frequently forgotten, probably because they do not pay attention and because the IEQ is difficult to assess and to convert into money, whereas energy can easily be converted.



For the HVAC world, it is important to increase the awareness on this problem. That's why AIVC considered that the present report, written in the framework of the IEA HYBVENT project, would be a valuable Contributed Report.

As its name indicates ('Considerations concerning costs and benefits with application to ventilation'), the report does not aim to be an exhaustive guide on the topic, but aims to give background information of the subject.

[AIVC Online http://www.aivc.org/publications/CR/CR5.htm](http://www.aivc.org/publications/CR/CR5.htm)

Low-pressure-drop HVAC design for laboratories

J. Weale, P. Rumsey, D. Sartor, L. Eng Lock

AIVC Contributed Report 06, 2007, 16 pp

Laboratory ventilation systems are designed to isolate and protect occupants from hazardous fumes and at the same time provide outside air at comfortable conditions. This often results in high air flow rates whereby the electrical fan energy use can be very high. For the building described in the paper, the fan energy use is 44% of the total electricity use in the building.

This guide is part of a series on best practices for laboratories and focuses on the use of low-pressure air distribution systems.

The guide presents several strategies for reducing the pressure drop in each component of the air distribution system.

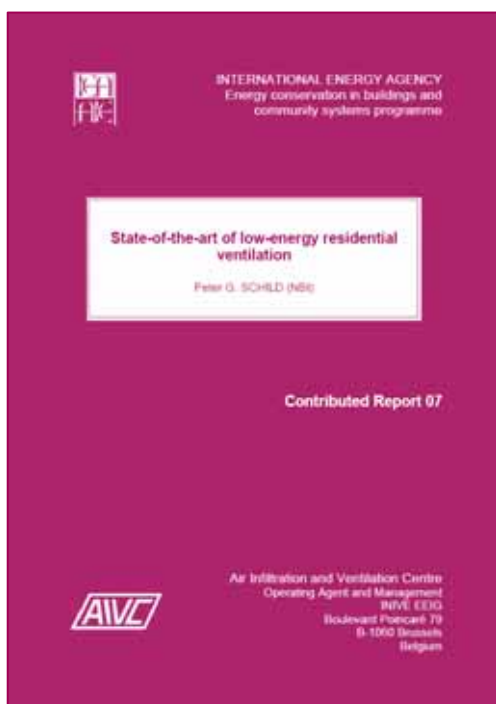
 <http://www.aivc.org/publications/CR/CR6.htm>



State-of-the-art of low-energy residential ventilation

P.G. Schild (NBI)

AIVC Contributed Report 07, 2007, 122 pp



This report has been produced in the framework of the EU RESHYVENT project (Cluster Project on Demand Controlled Hybrid Ventilation in Residential Buildings with Specific Emphasis on the Integration of Renewables).

It is a state-of-the-art report on low-energy ventilation.

 <http://www.aivc.org/publications/CR/CR7.htm>

Occupant behaviour and attitudes with respect to ventilation of dwellings

J.E.F. Van Dongen (TNO)

AIVC Contributed Report 08, 2007, 38 pp

This report has been produced in the framework of the EU RESHYVENT project (Cluster Project on Demand Controlled Hybrid Ventilation in Residential Buildings with Specific Emphasis on the Integration of Renewables).

This report deals with the issue of occupancy behaviour and acceptance, with a very important aspect for the introduction of new advanced technologies, especially in the residential sector. This is especially the case for demand controlled ventilation. How much shall the occupant be able to influence the ventilation? Health aspects have to be taken into account, which the user might not always be able to judge.



This working document gives information on how occupants use different ventilation provisions and systems, why they ventilate as they do and which moderating factors play a role.

Further special attention is paid to promoting and restraining factors for acceptance of new ventilation devices. The method used is a study of literature.

[AIVC-Online http://www.aivc.org/publications/CR/CR8.htm](http://www.aivc.org/publications/CR/CR8.htm)

Source Book for Residential hybrid Ventilation Development

W.F. de Gids (TNO)

AIVC Contributed Report 09, 2007, 74 pp

This report has been produced in the framework of the EU RESHYVENT project (Cluster Project on Demand Controlled Hybrid Ventilation in Residential Buildings with Specific Emphasis on the Integration of Renewables).

The purpose of this Source Book is to review reference data from all work packages in the Reshyvent project for the development and application of residential hybrid ventilation systems. It is concerned primarily with basic data and information for industrial parties who are involved in the development of components for residential demand controlled hybrid ventilation or complete systems for it.



This source book intends to help and guide industry during the pre-phase of the development process with information in the field of demand controlled hybrid ventilation.

[AIVC-Online http://www.aivc.org/publications/CR/CR9.htm](http://www.aivc.org/publications/CR/CR9.htm)

AIVC Conference 2007

Crete Island, Greece, 27-29 September 2007

Building Low Energy Cooling and Advanced Ventilation Technologies in the 21st Century

The joint 2nd Palenc and the **28th AIVC Conference** aims to focus on advanced low energy cooling and ventilation technologies for buildings.

Increased living standards, the deterioration of thermal conditions in the urban environment and non-appropriate architecture design have caused huge penetration of air conditioning in many parts of the world and not only in hot climates. Such a condition has a very serious impact on the peak electricity demand of the countries and the corresponding energy consumption. Intensive research carried out during the last years has allowed the development of new technologies, components, materials and techniques that allow the cooling demands of buildings to be decreased or even eliminated. In parallel, very low energy consumption for cooling new generation buildings have been realized and monitored.

Ventilation in buildings makes it possible to reduce the demand for cooling, improve comfort conditions and lower indoor pollution. A wide range of research activities carried out over the last years, has permitted engineers to develop advanced ventilation systems that satisfy the above requirements substantially.

Many countries have seen increased interest in regulations covering the issue of summer comfort, air conditioning and peak power control, e.g. the European Energy Performance of Buildings Directive asks from the Member States to undertake all the necessary measures in order to decrease the energy consumption caused by air conditioning and improve indoor environmental conditions (air quality, summer comfort, etc.). Passive and low energy cooling strategies provide interesting options.

The scope of this Conference includes all aspects of technology and building design, dealing with ventilation and passive cooling techniques to improve the environmental performance of buildings. Papers related on ventilation, solar control, thermal mass, thermal comfort, urban microclimate landscaping, low energy architecture, innovative components and materials, standardization and legislation, advanced and alternative air conditioners, demand side management, etc. are welcomed. The main aims are to present and discuss the state of research and applications dealing with ventilation and cooling and also to assess the results achieved almost two years after the application of the European Energy Performance of Buildings Directive.

Topics

- Passive cooling techniques
- Ventilation for cooling
- Solar control
- Thermal mass
- Natural ventilation
- Hybrid ventilation
- Heat protection techniques
- Advanced control systems and techniques
- Innovative material and components
- Ground cooling
- Evaporative cooling
- Radiative cooling
- Microclimate
- Heat island
- Canyon effect
- Applications in social housing
- Demand side management
- Legislation and in particular results from the application of the European Directive
- Education & distance learning
- Climatic responsive architecture
- Thermal comfort
- Indoor environmental quality
- High efficiency air conditioners

Venue

The Conference will take place at Aldemar Knossos Royal Village, Limes Hersonissou, Crete. Knossos Royal Village is one of the six Aldemar hotel.



Travel with Aldemar and sample some of the most unique 'flavours in the world' against the background of the Aegean Sea accompanied by the sounds of traditional Greek music. Savour the tastes of various gastronomic specialties in a luxurious atmosphere with top-quality service surrounded by exceptional natural beauty. Explore traditional Greek summer tastes. Experience moments full of... 'sea', on the beach, in a hospitable and fresh atmosphere.

The conference centre is located on the grounds of Knossos Royal Village and it can cater for groups of up to 900 people.

Visit the conference website:

<http://palenc2007.conferences.gr>

Conference secretariat

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Organisers

- Heliotopos Conferences
- Air Infiltration and Ventilation Centre
- Energy Conservation In Buildings And Community Systems

Register online at
<http://palenc2007.conferences>

	Thursday 27-09		Friday 28-09		Saturday 29-09	
08:00 - 09:00	Registration					
09:00 - 11:00	Plenary Session		Plenary Session		Plenary Session	
11:00 - 11:15	Coffee Break		Coffee Break		Coffee Break	
11:15 - 13:15	Palenc	AIVC	Palenc	AIVC	Palenc	AIVC
13:15 - 15:15	Lunch		Lunch		Lunch	
15:15 - 17:15	Palenc	AIVC	Palenc	AIVC	Palenc	AIVC
17:15 - 17:30	Coffee Break		Coffee Break		Coffee Break	
17:30 - 19:30	Palenc	AIVC	Palenc	AIVC	Closing Seession	
19:30 - 21:00	Welcome Reception				Cretan Party	

 Detailed schedule of the conference

AIVC Conference 2008

Kyoto, Japan, 14-16 October 2008

In 2008, when the target period of the Kyoto Protocol begins, the 29th AIVC Conference will be held at Kyoto International Conference Centre, Kyoto, Japan, where the protocol was negotiated in December 1997.

The conference will provide a valuable best opportunity for researchers and engineers worldwide to convene for **'Advanced building ventilation and environmental technology for addressing climate change issues'**.



*Kyoto International Conference Centre
(ICC Kyoto)*

The increase in Carbon Dioxide due to energy use in buildings is a common issue for most countries in the world.

Above all, it is expected that the energy use for indoor environmental control including ventilation, heating and air-conditioning must be substantially reduced to mitigate the global warming issue, while there are increasing demand for better indoor health and comfort.

For the 29th AIVC Conference, in collaboration with ECBCS, papers are invited for the following research and development topics:

- Natural Ventilation
- Mechanical Ventilation
- Hybrid Ventilation
- Air Filtering
- HVAC System for Non-residential building
- Heating and Air-conditioning for residential building
- Thermal Environment
- Standard and Regulation for Ventilation and HVAC
- Control Technology
- Commissioning
- Integration of Building Envelope and Services
- Envelope Air Tightness
- Condensation Prevention
- Energy Retrofitting
- Computer Simulation
- Post Occupancy Evaluation and Surveys
- Case Study Building
- Air distribution

Interested contributors are kindly asked to submit their abstracts electronically by **18 January 2008**.

An abstract of up to 300 words should be submitted, stating clearly the scope of the paper to be presented, the scientific methodology applied and the results obtained.

All abstracts will be reviewed and the authors will be notified about acceptance of their abstract by **22 February 2008**.

A book of the conference proceedings will be published and will be available to the participants during the conference.

Final papers due: **31 May 2008**.

<http://www.aivc2008.jp/>
info@AIVC2008.jp

 First announcement

Irish House of Tomorrow Programme



The Irish House of Tomorrow Programme had its origins in the Irish Government's Green Paper on Sustainable Energy in 1999, which highlighted deficiencies in the energy performance of Irish housing. Among the actions proposed to tackle this was a programme to develop and demonstrate energy efficient design and technology features in the housing sector.

After extensive industry consultation, the House of Tomorrow Programme was launched in September 2001. Within the framework of the National Development Plan 2000-2006, its budget allocation was €21.1M.

The aim of the programme has been to accelerate improvements in the quality of energy performance of Irish homes and to encourage the market uptake of cost-effective innovation.

Central to this is the establishment of a nationwide network of living examples of homes incorporating superior energy features new to the mainstream Irish market. These are homes that offer significant benefits to consumers in terms of comfort, economy and convenience and to the country in terms of meeting environmental obligations and reduced dependence on imported fossil fuels.

Specifically, the House of Tomorrow programme aims to:


- support superior energy design and technology practices;
- tackle systemic barriers to sustainable energy within the building industry;
- promote market awareness of best practices; and
- stimulate sustainable energy research, development and demonstration.

The heart of the programme is a demonstration scheme which part funds private and social housing developments that deliver a saving of over 40% in energy consumption and associated CO₂ emissions relative to what would apply under current Building Regulations.

Initial take-up was modest as SEI (Sustainable Energy Ireland – <http://www.sei.ie>) worked to raise awareness of the programme and overcome traditional attitudes to change within the industry. By the end of 2003, just nine demonstration projects had been approved. But from mid-2004, demand and interest in the programme began to grow dramatically. In all, 35 projects were approved in 2005 and 60 in 2006, and today over 10 new applications are being received each month. In total, over 150 housing developments have attracted support of €33M, involving over 6000 units in every county in Ireland.

Co-funding from developers of a further €50M brings joint investment in sustainable energy solutions to over €80M since 2001.

As will be seen from the list of projects in the accompanying table of the report (Building for the future, p12-15), these developments use a strong array of innovative technologies and practices, from insulation materials, advanced windows, and highly efficient boilers, to **healthy ventilation control systems**, energy efficient lighting and renewable energy systems including solar, heat pumps and biomass heating.

 SEI / House of Tomorrow – Building for the future (18 pp)

International Journal of Ventilation Special Edition: EPIC AIVC Conference


The common EPIC – AIVC Conference was organized in Lyon (France) between 22nd and 24th November 2006. A very high number of excellent papers were presented and the conference was regarded as being of high scientific quality. More than 80 of the papers presented at the conference dealt with ventilation studies and most of these reported very interesting and innovative results.


Among the best papers, 10 have been selected for publication in the International Journal of Ventilation. The papers have been rewritten to fit the standards of the Journal and are fully reviewed.

The selected papers are:

1. Monitoring Results of a Naturally Ventilated and Passively Cooled Office Building in Frankfurt, Germany - Andreas Wagner, Michael Klebe¹ and Christopher Parker
2. Flow Pattern Effects on Night Cooling Ventilation - Jose Manuel Salmerón Lissen, Juan Antonio Sanz Fernández, Francisco José Sánchez de la Flor, Servando Álvarez Domínguez and Álvaro Ruiz Pardo
3. Numerical Evaluation of Earth to Air Heat Exchangers and Heat Recovery Ventilation Systems - F. Chlela¹, A. Husaunndee¹, P. Riederer¹ and C. Inard
4. Urban Canyon Influence on Building Natural Ventilation - K. Syrios and G. R. Hunt
5. Study of the Airflow Structure in Cross-Ventilated Rooms based on a Full-Scale Model Experiment - Shigeki Nishizawa¹, Takao Sawachi, Ken-ichi. Narita, Nobuyoshi Kiyota, Hironao Seto
6. Vent DisCourse: Development of Educational Material on Energy Efficient Ventilation of Buildings - M Kolokotroni, J Shilliday, M Liddament, M Santamouris, I Farrou, O Seppanen? R Brown, J Parker and G Guarracino
7. Application of the PHACES Tool in the Design of Natural Ventilation for Passive Cooling - M. El Mankibi and P. Michel
8. Exergy Analysis as an Assessment Tool of Heat Recovery of Dwelling Ventilation Systems - P. Sakulpi-patsin, E.C. Boelman and J.J.M. Cauberg

9. Potential of Natural Ventilation in a Tropical Climate - Leopoldo Eurico Gonçalves Bastos and Cláudia Barroso-Krause
10. The Real Life Efficiency of Gas Phase Filters Used in General Ventilation and their Influence on the Indoor Air Quality of an Office Building - Alain Ginestet and Dominique Pugnet

 Read the abstract of the selected papers

 Special issue of the International Journal of Ventilation

About the International Journal of Ventilation

The IJV is a peer reviewed which is Journal published quarterly. It is aimed at publishing research papers on ventilation theory and development. First published in June 2002, the Journal has now commenced its sixth year of publication.

Topics include:

- Research into the development or application of ventilation;
- Validated case studies demonstrating the performance of a ventilation strategy;
- Information on needs and solutions for specific building types including: offices, dwellings, schools, hospitals, parking garages, urban buildings and recreational buildings etc;
- Developments in numerical methods;
- Measurement techniques;
- Related issues in which the impact of ventilation plays an important role (e.g. the interaction of ventilation with air quality, health and comfort);
- Energy issues related to ventilation (e.g. low energy systems, ventilation heating and cooling loss);
- Driving forces (weather data, fan performance etc).

In addition to being produced in print the International Journal of Ventilation is also published online and is available through most of the major online library providers. A call for papers and full subscription details plus listings and abstracts of all papers may be found at <http://www.aivc.org>.

ASHRAE Publishes New Standard 62.1 and 62.2

ANSI/ASHRAE Standard 62.1-2007, *Ventilation for Acceptable Indoor Air Quality* specifies minimum ventilation rates and other measures intended to provide indoor air quality that is acceptable to human occupants and that minimizes adverse health effects. This standard applies to all spaces intended for human occupancy except those within single-family houses, multifamily structures of three storeys or fewer above grade, vehicles and aircraft.



The new standard includes requirements for the separation of areas with environmental tobacco smoke (ETS) from areas without ETS in the same building. Although some local building and health codes prohibit smoking indoors in many buildings and locations, other codes allow smoking in designated areas. In buildings that allow smoking in designated areas, effective separation of ETS areas ensures 'ETS-free' areas contain little or no ETS-related contaminants.

Another change clarifies of how designers must analyse mechanical cooling systems to help limit space relative humidity. Many buildings suffer from air quality problems related to dampness, including mould and other microbial growth. In the past, the standard required a design analysis at specified load conditions, in an effort to demonstrate that a given design approach in a given climate could successfully limit space RH to 65 percent or less.

Other changes include:

- Additions to Table 6-1 of minimum outdoor air requirements for dwelling units in high-rise residential buildings. These requirements apply to residences in buildings over three stories. Low-rise residential buildings are covered by ASHRAE Standard 62.2
- New or previously overlooked occupancy categories. In response to proposed changes from users of the standard, ASHRAE added several occupancy categories to Table 6-1 with associated minimum outdoor air rates. These include, for example, day-care sickrooms, university/college laboratories, break rooms and coffee stations, and laundry rooms.

The 2007 version of the ASHRAE residential indoor air quality standard is now also available.

ANSI/ASHRAE Standard 62.2-2007, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*, defines the roles of and minimum requirements for mechanical and natural ventilation systems and the building envelope intended to provide acceptable indoor air quality in low-rise residential buildings.

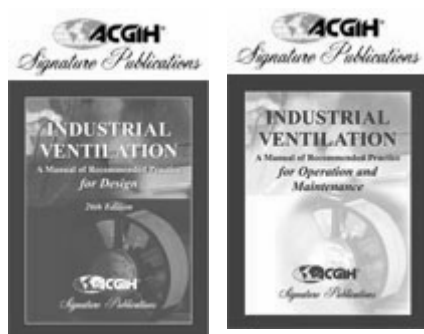
Changes to the standard from the 2004 version include application of exceptions based on climate map zones vs. degree-day based, making it easier to apply the standard; inclusion of a new technology of condensing dryers that do not have an exhaust flow like traditional dryers; and a change in requirements for testing and rating ventilation fans.

More information can be found at <http://www.ashrae.org>

Two new manuals about industrial ventilation

ACGIH, The American Conference of Governmental Industrial Hygienists, recently published two new manuals about industrial ventilation.

Since its first edition in 1951, '*Industrial Ventilation: A Manual of Recommended Practice*' has been used by engineers and industrial hygienists to design and evaluate industrial ventilation systems. The 26th edition of this Manual has been renamed '*Industrial Ventilation: A Manual of Recommended Practice for Design*' (the Design Manual) and addresses design aspects of an industrial ventilation system. Four new chapters have been added providing information on exposure assessment, preliminary ventilation system design considerations, ventilation system costs and energy considerations.



This manual complements the new '*Industrial Ventilation: A manual of recommended practice for operation and maintenance*' (the O&M Manual), which is written for employees and their managers who must use and maintain industrial ventilation systems in the workplace. Each chapter is a comprehensive guide for users of industrial ventilation systems through their duties and responsibilities, and provides information on how the systems work, recommended maintenance frequency, and troubleshooting guidance.

The American Conference of Governmental Industrial Hygienists (ACGIH) is a member-based organization (4000 members) that advances occupational and environmental health.

More information can be found at <http://www.acgih.org>

PREBAT Report phase 1 on international comparison of buildings and energy published



The protocol of the French Research Programme on Energy Efficiency in Buildings (PREBAT – <http://www.prebat.fr>) sets out that one of the first actions to achieve is a '*state-of-the-art at a national and international scale, in research, good professional practices and the most advanced buildings*'; this state-of-the-art will serve as the foundation for continuous surveillance throughout the duration of PREBAT and will provide a basis for dissemination and valorisation actions'.

The intermediate report on the *International Buildings and Energy Comparison*, corresponding to the state-of-the-art priority set out by the protocol is now available. This research, overseen by CSTB, is co-funded 50% by ADEME - French Environment and Energy Management Agency, 25% by PUCA – Urban Development Building and Architecture Plan and 25% by research funds allocated by the CSTB and its expert partners.

The international comparison project provides an analysis of the *high-performing programmes operating in a number of foreign countries, including their components and equipment as well as research and development programmes*. The project is divided into two phases with an intermediate report in 2006 and a final report in 2007. This report provides an account of the first phase.

The structure of the [report](#) (435 pages – in French) is as follows:

- Summary and synthesis
- Information on national programmes (Germany, USA, Japan, etc.)
- Innovative components and equipments (including chapters on ventilation systems)
- Research programmes (Austria, Netherlands, etc.)
- Conclusions
- Annexes

A [summary in English](#) is available.

Emissions and odours from materials - 5th Edition

17-18 October 2007,
Brussels, Belgium

Nowadays, air quality in confined spaces such as vehicles and buildings concerns more and more industries and scientists. Plastic materials, solvents, varnishes, coatings, insulating materials, glues, carpets, textiles, etc. are emitting volatile organic compounds (VOC) that contribute to the ambient air quality in terms of odours and pollutants. In food, drugs and cosmetic industries, the use of packaging can have an impact on the organoleptic perception of products and even on their quality. The need for communication between industrial groups working on this subject is obvious, particularly with respect to discussing research, disseminating information, promoting activities...

With the participation of leading industry professionals, standards & regulatory experts, R&D scientists, material specialists, industry analysts and market players, the conference offers an ideal platform for fact sharing and the acquisition of new knowledge among participants and speakers.

The conference will address the following topics:

- Standards and regulatory issues: updating EU-legislation (REACH, superdirective, etc.) and labelling schemes.
- Comfort and impact on health: IAQ, workplace environment, odours and VOCs, off-flavours, etc.
- State of the art for measurement and evaluation: sampling, analysis and sensory evaluation.
- Remediation: optimisation of manufacturing and compounding processes, storage and transport conditions, new barrier properties, etc.
- Recent developments: new OEM requirements, latest trends, new products (low-VOC products, new additives formulations...) in automotive, building and packaging industry

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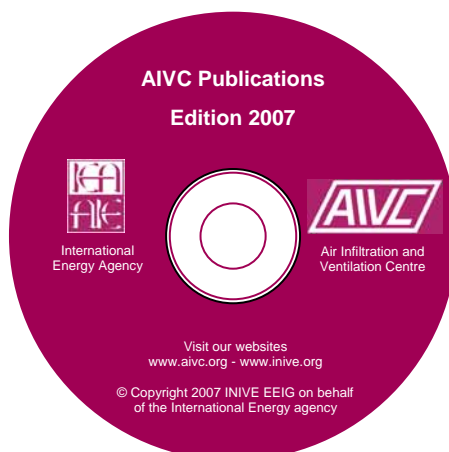
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