

AIR INFORMATION REVIEW

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A quarterly newsletter from the IEA Air Infiltration and Ventilation Centre

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The AIVC CD and a New Style for AIR - Here Now!

As announced in the March and June issues of AIR, the September issue is intended to reflect the AIVC's new approach. We are pleased to present this newsletter and the accompanying AIVC CD. Our target - 'more information – more users – lower cost' - has certainly been achieved here: the newsletter contains more than fifty contributions, and some 200 Mb of information is stored on the accompanying AIVC CD, corresponding to 3,000 pages of information. Moreover, 13,500 copies of AIR and the AIVC CD are being distributed free of charge.

It was important to achieve the 'quantity' targets, yet even more important to achieve the 'quality' targets. If we are to be your companion in the ventilation world, we should not only inform you of new developments and new sources of information, but also give guidance and highlight the relevance of certain developments in relation to ventilation, indoor climate and energy. This will receive particular attention in forthcoming issues of AIR.

From the December issue on, the procedure for obtaining AIR and the AIVC CD will vary according to whether or not you live in an AIVC country  and whether or not you have an INIVE EEIG member organisation  in your country. *Subscriptions* can be taken out by mail, fax or post. We hope and expect to have more AIVC member countries and INIVE members in the near future, so that many more people will receive AIR and the AIVC CD free of charge or at very low cost.

Your reactions to and suggestions for this new approach will be highly appreciated, as will suggestions for contributions for forthcoming issues of AIR and the AIVC CD. So please contact us at inive@bbri.be.

Finally, we would like to draw your attention to the fact that the AIVC conference in 2002 will be organised in conjunction with the EPIC conference (Lyon, France, 23rd -26th October 2002) and that the deadline for abstracts is November 15th.

We hope you will have many hours of pleasurable and informative reading.

Peter Wouters, Operating Agent of the AIVC and Manager of INIVE

AIR

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 and CD is to encourage and increase information exchange among ventilation researchers and practitioners worldwide.

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Contributions to AIR: Suggestions for contributions are welcomed.

Subscriptions: (See also subscription form on page 15 or on the CD)

1) Private Subscriptions

For individuals or small companies with less than 100 employees. Subscription is for 4 newsletters with CD/year.

Rates: AIVC member countries (Belgium, France, Greece, Norway and USA): 200 Euro/year (Renewal: 100 Euro/year).

Non-AIVC member countries: 400 Euro/year (Renewal: 200 Euro/year).

2) Organisational Subscriptions

For large organisations. The subscription is for 4 newsletters with CD/year (3 copies provided).

Rates: AIVC member countries (as above): 500 Euro/year (Renewal: 250 Euro/year).

Non-AIVC member countries: 1000 Euro/year (Renewal: 500 Euro/year).

3) Special Subscriptions

Available to enquirers in countries of INIVE members (Belgium, France, Greece and Norway) at reduced rate or even free of charge. Contact the INIVE representative for your country (page 16).

4) Free electronic version (without links): www.aivc.org.

GUIDE TO THE NEWSLETTER

Throughout the newsletter you will see [websites](#) and [email contacts](#). A jump to the AIVC CD is shown with . Simply click to jump to your chosen website, to send an email, or to go to the CD document. For an overview of the contents of the CD click here .

WEBSITE INFORMATION

ASHRAE: The American Society of Heating, Refrigerating and Air Conditioning Engineers

ASHRAE is an international organization of 50,000 members with chapters throughout the world. The Society is organized for the sole purpose of advancing the arts and sciences of heating, ventilation, air conditioning and refrigeration for the public's benefit through research, standards writing, continuing education and publications.

ASHRAE is concerned with the technical means for conditioning of the indoor environment and with the specification and creation of conditions which provide a comfortable and healthful air quality for occupants of indoor environments. At the same time, the Society is fully aware of increased concerns about inadequate indoor air quality and the effects on occupant health and comfort. ASHRAE is committed to the goals of design, operation and maintenance of systems which provide comfortable and healthful indoor environments in buildings consistent with the most effective energy use. Standards and others publications can be ordered online. Web www.ashrae.org.

Ventilation in the New French Thermal Regulation RT 2000

Ventilation plays an important role in the RT 2000 regulation. This new French thermal regulation takes into account energy for heating ventilating and lighting through a C coefficient (primary energy in kWh), as well as summer comfort for non air-conditioned buildings .

For the ventilation side of the C calculation, the calculation method aims both to have simple input data and physically based algorithms. The algorithms are based on an implicit method as TC 156 WG2 (prEN 13465) extended to non-residential buildings. Different ventilation or airing systems can be taken into account, based on the possibilities offered by the hygienic regulation : mechanical system and passive duct systems for residential buildings (additional window airing is also considered), window opening and mechanical systems in non-residential buildings.

Airtightness of the building envelope and ventilation ducts is also taken into account.

For each situation of climate and system behaviour the implicit method calculates the different airflows through the ventilation system and the building envelope in a first step, and the energy impact (both for heating needs and fan electrical needs) in a second step.

For summer comfort, mechanical systems (including night cooling) and window airing are considered. Web www.cstb.fr/rt2000

The IEA's Energy Conservation in Buildings and Solar Heating and Cooling Websites - Among Others!

The International Energy Agency (IEA) 

The International Energy Agency (IEA) was established in 1974 as an autonomous agency within the framework of the Organisation for Economic Cooperation and Development (OECD) to carry out a comprehensive program of energy cooperation among its 25 member countries and the Commission of the European Communities. Web <http://www.iea.org/>.

An important part of the Agency's program involves collaboration in the research, development and demonstration of new energy technologies to reduce excessive reliance on imported oil, to increase long-term energy security and reduce greenhouse gas emissions.

Collaborative programs in the various energy technology areas are conducted under Implementing Agreements, which are signed by contracting parties (government agencies or entities designated by them). There are currently 40 Implementing Agreements, categorised under the headings "Information Centres and Modelling", "Fossil Fuels", "Renewable Energy", "Energy End-Use Technologies" and "Fusion Power".

IEA Solar Heating and Cooling Programme (SHC)

The Solar Heating and Cooling Programme (SHC) was one of the first IEA Implementing Agreements to be established. Since 1977, its 21 members have been collaborating to advance active solar, passive solar and photovoltaic technologies and their application in buildings. Web www.iea-shc.org

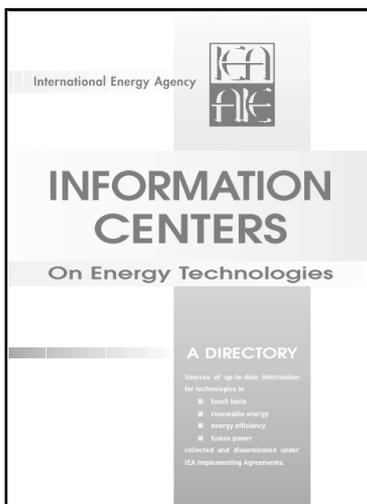
IEA Energy Conservation in Buildings and Community Systems (ECBCS)

In recognition of the significance of the energy use in non-industrial buildings such as dwellings, offices, hospitals, and schools, the International Energy Agency has established an Implementing Agreement on Energy Conservation in Buildings and Community Systems (ECBCS). The function of ECBCS is to undertake research and provide an international focus for building energy

efficiency. Tasks are undertaken through a series of annexes that are directed at energy saving technologies and activities that support their application in practice (for example, annex 5 of ECBCS is known as the Air Infiltration and Ventilation Centre (AIVC) (Web <http://www.aivc.org>)). Results are also used in the formulation of international and national energy conservation policies and standards. Web <http://www.ecbcs.org/> The ECBCS Newsletters for October 2000  and June 2001  are available on the CD.

Other interesting websites of the same type :

- Energy Technology Data Exchange
ETDE: Web www.etde.org
- The Automotive Fuels Information service
AFIS: Web <http://home2.swipnet.se/~w-24173/>
- The Clean Coal Centre : Web www.iea-coal.org.uk
- The International Centre for Gas Technology Information ICGTI: Web www.GTOnline.org
- The Heat Pump Centre: Web www.heatpumpcentre.org
- CADDET Energy efficiency: Web www.caddet-ee.org
- Greenhouse Gas Technology Information Exchange GREENTIE: Web www.greentie.org. (GreenTimes, the latest newsletter - Web www.greentie.org/gt_012.pdf)



IEA Information Centers Brochure

'IERIE' - The Inventory of European Research on the Indoor Environment

The MRC Institute for Environment and Health, based in Leicester, UK, recently launched onto the Web a comprehensive database of indoor environment research in Europe. Funded through the Long-range Research Initiative of the European Chemical Industry Council (CEPIC), this database aims to provide an up-to-date source of information that can be used to:

- Provide information on current topics relating to the indoor environment
- Identify gaps in research in the indoor air environment
- Identify new advances in the indoor air field
- Assist in the prioritisation of future research on the indoor air environment

As well as aiding information exchange between researchers, IERIE will facilitate more targeted research across Europe and help to ensure that funding resources are allocated efficiently and effectively. Studies on indoor air environment monitoring, ventilation, exposure assessment, building characteristics, health effects, epidemiology and toxicology are all included. Web <http://wads.cfs.le.ac.uk/ieh/ierie/index.htm>

The site includes a downloadable questionnaire for completion by researchers working in the indoor air field who wish to be included on the database.

HVAC Organisations

A few of the many HVAC organisations with information on the Web.

REHVA is the Federation of European Heating, Ventilating and Air-conditioning Associations.

The objectives of REHVA are to promote internationally the science and practice of heating, ventilating and air-conditioning, and to advance education in this field. Web www.rehva.com.

CIBSE, the Chartered Institution of Building Services Engineers, is an international body which represents and provides services to the building services profession (lighting, heating, ventilation, air conditioning, public health systems and lifts).

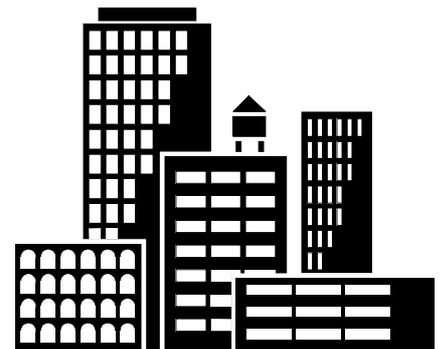
The Institution has two main functions: to confer an internationally recognised badge of quality, and to undertake a wide range of learned society activities ranging from producing information services and acknowledged industry good practice publications in its series of guides and other publications, to running a wide range of events, to providing extensive networking activities through a series of regional and special interest groups. Web www.cibse.org.

Scanvac is a joint organization in which the national societies of Heating, Ventilating and AirConditioning in Denmark, Finland, Iceland, Norway and Sweden participate. The corresponding societies in the Baltic states Estonia, Latvia and Lithuania are associated members of Scanvac.

Scanvac is a body for the promotion of close cooperation between the national HVAC societies. They are professional and technical societies devoted to promoting the arts and sciences of heating, ventilating, air conditioning and allied technologies and training activities in these fields. Web www.scanvac.net.

TVVL is the Dutch technical association for installations in buildings.

The objective of the Association is the promotion of science and technology on installations in buildings and comparable objects. TVVL is subdivided into three sections, namely HVAC, Electrical Engineering & Building Automation and Sanitary Engineering. Web www.tvvl.nl.



INIVE Partners' Websites

The Belgian Building Research Institute (CSTC-WTCB) (Web www.bbri.be) is the collective research institute at the service of the Belgian building industry (65000 building contractors) and it is a founding member of ENBRI (European Network of Building Research Institutes). Its Directorate for Scientific Research covers the various fields of building science.

BBRI has wide experience in monitoring and modelling buildings with regard to energy performance, indoor climate and ventilation aspects. The institute also has a strong involvement in Belgian building practice through, on the one hand, different technical committees formed with building contractors and, on the other hand, its advisory service answering about 20,000 queries per year to the building sector.

CETIAT (Technical Centre for the Heating, Ventilation and Air Conditioning Industries) (Web www.cetiat.fr) is a French research centre which

was set up in 1960. There is a staff of 140 and an annual turnover of 10.5 million Euro.

The membership consists of 280 French manufacturers of heating, ventilation, air handling, air conditioning, dust extraction, air filtration, air drying and air humidifying equipment.

The Centre operates co-operative research for its members and subscribers on topics such as air quality / air management in buildings, fan noise, heat exchanger improvement, thermodynamics and new refrigerants, hot water heating systems, combustion and combustion noise, and vibrations. It also runs a study centre performing tests, performance certification, calculations, technological watch, and studies for its members or various customers from the industry. The organisation is also involved in several European and standardisation groups within CEN and ISO, publishes technological watch bulletins for the industry and operates research and consultancy on various air handling equipment for building and transport, within national or European projects.

The Centre Scientifique et Technique du Bâtiment (CSTB) (Web www.cstb.fr) operates closely with its partners in the building industry such as construction professionals and manufacturers. Its status allows it to be independent of any specific sector of the industry and to lead a multi-discipline approach to innovation and to solving the construction industry's most complex problems. CSTB comprises 600 employees, including 300 engineers, research workers and experts in a wide range of topics such as building materials and techniques, equipment, safety, thermal energy, acoustics, aerodynamics, lighting, environmental and health issues, advanced information and communication technology, as well as economics and sociology.

The main CSTB activities are:

- fundamental research,
- promoting its know-how in consultancy (study, technical assistance) to manufacturers, architects, building owners and authorities,
- evaluating innovative techniques and products for French and foreign manufacturers,
- assisting administration in setting up regulations, standards and European normalisation.

CSTB actively participates in ENBRI (European Network of Building Research Institutes) which unites Europe's main building RTD centres and is an active member in many CEN Technical committees. CSTB is also a key participant in several major European research specific programmes (including involvement in more than

fifty projects in FP4) and is already helping several hundred clients in Europe.

CSTB has worked in the field of ventilation and energy since the mid sixties. The work in this field is conducted in the Energy, Indoor environment and Automation Service (32 employees) and covers a wide range of activities:

- ventilation performance in buildings
- air motion modelling within rooms
- air flow and contaminant modelling in buildings
- development of measurement techniques and test procedure
- energy management in buildings
- energy-efficient retrofit of buildings

The Norwegian Building Research Institute (NBI) (Web www.byggforsk.no) was established in 1949 and became an independent, private foundation in 1985. NBI serves as the national research and development centre for the building and construction industry in Norway. NBI serves central and local authorities, industry, building consultants and the public. Income is based on commissioned research and development for private companies, central and local authorities and sale of publications. Basic funding through the Norwegian Research Council amounts to 5% of annual turnover.

There are 160 employees including 110 with advanced degrees in the fields of building technology, mechanical and chemical engineering, computer science, architecture, social sciences and arts. About 40 employees work in the area of ventilation, indoor climate and energy issues. The head office is located in Oslo and a branch office located in Trondheim on the campus of the Norwegian University of Science and Technology.

Areas of work and expertise include: Building technology, Energy efficiency and indoor environment, Performance requirements for buildings and services, Sanitary engineering, Product development and testing, Approval and certification, Building pathology, Building administration, maintenance and rehabilitation, Quality management, Economic studies of the building market, dwellings, housing requirements and planning.

and finally...

The Building Environmental Studies Group at the University of Athens (NKUA) (Web www.uoa.gr) carries out research and education and provide services in the field of ventilation in buildings. The group primarily specializes in studies and research in the field of natural ventilation and indoor air quality in buildings.

In terms of research, the group has coordinated the European research project PASCOOL, aiming to advance knowledge in the field of natural ventilation for building cooling. The group has designed and carried out specific experimental campaigns to access the potential of natural ventilation in buildings, while it has developed the network calculation model PASSPORT-AIR which can estimate the air flow in naturally ventilated buildings. Within the frame of the same project the group has contributed to the development of appropriate guidelines on the application of natural and night ventilation techniques. More recently, the group has been involved in the field of hybrid ventilation, and participates in the specific IEA action as well as in the European Research project HYBVENT.

In parallel, the group has worked for many years on the specific characteristics of natural ventilation in urban areas. In the frame of the POLIS and URBVENT European research projects the group has carried out specific experiments in a great number of urban canyons and has contributed greatly to advances in the knowledge on this topic. The results of the above research have been recently published in the book 'Energy and Environmental Quality in the Urban Built Environment', published by James and James Science Publishers

Finally, the group has worked on many projects related to indoor air quality in buildings. It has participated in the European Survey program and has carried out specific measurements in buildings trying to identify the role of ventilation on air quality.

In education, the group has coordinated the European program AIOLOS, aiming to produce educational material in the field of natural ventilation in buildings, resulting in the publication, in collaboration with the other participants, of 'Natural Ventilation in Buildings', by James and James Science Publishers, while the educational computational tool AIOLOS has been also developed. In parallel, the scientific knowledge of the group on the field of convective passive cooling, has been translated into an educational book, 'Passive Cooling', also published by James and James.

Finally, the group has undertaken specific national and international building design projects proving expertise on the implementation of natural ventilation, passive cooling and indoor air quality. Some of these include: The Fatima church in Portugal, sport centers in London, The Delphi Museum, and many more.

Translating on the Web - AltaVista Babelfish

Even if you are multilingual, interesting websites on ventilation are not always available in a language you can understand.

The AltaVista Translation box (also called Babel Fish) enables you to translate short passages to and from English to a number of languages (for example, Spanish, French, German, Italian, Russian, Japanese, ...) and to and from several specific pairs of languages (for example, German to French, French to German). You can also translate websites very easily: Just write the address of the site in the dialogue box, select the appropriate languages and click on the 'Translate' button.

You can reach the AltaVista Translation box from several locations on the AltaVista site (Web www.altavista.com). One of the possible links is the "translate" link marked by a small yellow fish on the home page of AltaVista.

CSTB: Scientific and Technical Software - COMIS

The French Scientific and Technical Centre for Buildings (CSTB, Centre Scientifique et Technique du Bâtiment – Web www.cstb.fr) is currently setting up a new website to present its scientific and technical software tools – Web <http://software.cstb.fr>

The products created or distributed by this software development team are based on the scientific knowledge of CSTB and its partners. Activities include software development, electronic data interchange and virtual reality. The website is regularly updated to include new software products, and information about related events in France and the world.

Products presented include building simulation tools, a CAD tool for building simulation, thermodynamics software, solar hot water system dimensioning, and more.

Of particular interest for the AIR reader is the COMIS software. A freeware version of COMIS (COMIS 3.0, one of the official results IEA ECBCS Annex 23) is included on the AIVC-CD , with installation instructions . CSTB is selling an up-to-date version of COMIS on the software website.

Check forthcoming issues of AIR for more demo software (e.g. TRNSYS).

Bonn Conference on Climate Change

In Bonn, the 6th session of the so-called 'conference of the parties to the UN framework convention on climate change' was held from 16

to 27 July. Since it concerns the implementation of the Kyoto protocol, and given the fact that targets on CO2 reductions have a strong impact on energy policies, it is clear that the outcome of this conference is of considerable interest to people involved in ventilation activities.

A very good summary of the outcome of this conference is provided by the International Institute for Sustainable Development at Web <http://www.iisd.ca/climate/cop6bis/>, or on the AIVC CD in English  or French .

U.S. Residential Ventilation Simulation Program on the Web

A World Wide Web based analysis program is now available for estimating the annual ventilation and related energy and cost liabilities for U.S. houses. It uses the knowledge and databases resident at the Lawrence Berkeley National Laboratory to allow the calculation of residential ventilation for any house in the United States. Both infiltration and mechanical ventilation are considered and the program has dynamic defaults based on field measurements. Furthermore, it calculates the ventilation rates appropriate for determining indoor air quality (through ventilation standards) as well as the energy penalty and associated costs of both providing the ventilation and conditioning the ventilation air.

Web <http://epb1.lbl.gov/ventilation/program.html>

NEWS FROM PRACTICE

Ventibel – The Belgian Professional Federation of Ventilation Firms

With the aim of promoting indoor air quality in buildings, some Belgian companies active in the field of ventilation have decided to create their own professional federation.

This association started officially on June 1st 1999 and was called "VENTIBEL", clearly reflecting the organisation's national nature.

The initiative was taken with the aim of making the market aware, and emphasizing the importance of obtaining a healthy and comfortable indoor climate in new or refurbished buildings. The purpose is to improve knowledge of ventilation systems among public authorities, architects and fitters, by informing them about systems, products, novelties, standards, and so on.

Ventibel will therefore become a valued interlocutor, endeavouring to centre all its efforts on "quality".

Ventibel represents Belgian companies which are manufacturers or importers of products with a direct link to ventilation. Web www.ventibel.be

HR Ventilatie NL: the Dutch Organisation for High Efficiency Ventilation



A few years ago about six industrial organisations for ventilation and heat recovery in dwellings founded the Dutch Organisation for High Efficiency Ventilation. They were supported by other organizations such as the Association of Dutch Installers (VNI), The Dutch Organization for Energy and Environment (NOVEM) and the GAS UNION.

The main goal of the Dutch Organisation of High Efficiency Ventilation is to promote balanced ventilation with heat recovery. They not only promote heat recovery in relation to balanced ventilation, but also give other properties of dwellings to reach an optimum energy performance in dwellings. Due to their effort dwellings have become much more airtight. A few years ago balanced ventilation and heat recovery was applied in less than 1% of the Dutch dwelling stock. Nowadays about 4 – 8 % of the total dwelling stock has balanced ventilation with heat recovery. This remarkable increase has been mainly the result of two actions which have taken place in the Netherlands:

- The promotion of good balanced systems in general by the Dutch Organisation of High Efficiency Ventilation, and
- The Energy Performance Regulations, which have pushed very hard towards energy efficient ventilation.

The most logical solution was balanced ventilation with heat recovery. However since the development of hybrid ventilation systems, demand controlled systems with natural supply and mechanical exhaust also seem to be very energy efficient.

Belgian Advisory Network for Health Aspects of Building Materials (BANHAM)

Techniques and products evolve so quickly and fundamentally in certain fields that some enterprises, and particularly small and medium-sized firms, cannot always follow the latest developments. Therefore, with the support of the

three Belgian regions, some collective research institutes have set up so called "Technological Guidance Services". The objective of the services is to create a link between scientific research and the daily practice of enterprises.

Since the health aspects of building materials are a current topic of concern in different sectors, some of the Technological Guidance Services have decided to create the Belgian Advisory Network for Health Aspects of Building Materials (BANHAM), in order to assure an efficient transfer of information in this particular field. The research institutes involved at present are: the Belgian Building Research Institute, the Coating Research Institute, the Scientific and Technical Service Centre for the Belgian Textile Industry, and the Technical Centre for the Wood Industry.

Read the BANHAM newsletter in French  or Dutch .

A German Professional Association for the Support of Airtightness in Buildings - FliB

The Association for Airtightness in Building (Fachverband Luftdichtigkeit im Bauwesen e.v. - FliB) was founded in April 2000 in Kassel (Germany). The association develops uniform measuring standards to promote quality assurance in building construction. It provides standards to synchronize measuring procedures, and offers seminars and certificates.

However, simply demanding airtightness in buildings via the regulations is not enough; a check of the real system in the field is also required. The association promotes research and development, sums up the technical situation by creating professional rules, and supports legislation and standardization. For example, the measuring standard (DIN EN 13829) which had been completed referring back to ISO 9972, was updated on some issues by means of a supplement from the Association to guarantee as far as possible – at least in Germany – a uniform realization and consequently a common standard of comparison for airtightness measurements.

The obligation to verify adequate airtightness in buildings is anchored in the energy saving regulation (Energieeinsparverordnung– EnEV). Based on the EnEV it can be expected that more airtightness measurements will be carried out. The association will try to secure the quality of services by offering certification of competent service providers. The first service providers will be certified at the beginning of 2002.

Details regarding airtight construction, appropriate materials and products are being checked and compiled. Uniform criteria for evaluation and examination will be worked out to increase the

reliability of planning and execution, striving for a "Certificate of airtightness as per FliB". The association will publish a yearly statistical overview on the measurements taken by members.

Natural or corporate bodies can become members, as well as associations or institutions that are supporting vigorously and to their full extent, the goals mentioned previously. More information and contacts can be found on the homepage Web www.flib.de (in German).

INFO FROM PROJECTS

Hybrid Ventilation – the State of the Art Report from the HybVent Project

Hybrid ventilation systems aim to provide a comfortable internal environment by combining both natural ventilation and mechanical systems. Hybrid ventilation uses different features of each system depending on the time of the day or the season of the year. The basic philosophy is to maintain a satisfactory indoor environment by alternating between and combining the systems to avoid the cost, the energy penalty and the consequential environmental effects of full year-round air conditioning.

HybVent is an international four-year research project (IEA ECBCS Annex 35) running from 1998-2002 with participation from about 30 research institutes, universities and private companies from 15 countries world wide.

The objectives of the HybVent-project are:

- to promote energy and cost-effective hybrid ventilation systems in office and educational buildings,
- to develop methods to predict hybrid ventilation performance, and

- to develop control strategies for hybrid ventilation systems.

Web www.civil.auc.dk/hotel/hybvent/index.htm

For more information see the whole report, with pilot project summaries and much more, on the AIVC CD .

Danish Hybrid Ventilation Centre at Aalborg University

Aalborg University has, with the support of the Villum Kann Rasmussen Foundation, established a research center for hybrid ventilation in order to intensify research and strengthen international co-operation on Hybrid Ventilation. The running period is for the time being from 2001-2006 and the research effort will be in the range of 20 man-years. Centre activities will be managed by Professor Per Heiselberg.

The main objective of the Hybrid Ventilation Centre is to develop new and improve existing design methods for hybrid ventilation to a level where they can match design methods for mechanical ventilation. The research programme will mainly focus on gaining knowledge and developing models for natural ventilation and on integration of natural ventilation models with existing ventilation design tools and methods.

A secondary objective is to enhance international cooperation and knowledge transfer to Danish research and industry by inviting leading international experts to join the centre for shorter periods. Web www.hybridventilation.dk

NavIAQ Program from TNO: a Software Tool from the NatVent Project

To design for the correct opening size of natural air inlets, an interactive tool (NavIAQ) has been developed within the completed EU project NatVent. The design tool makes it possible to calculate the size of natural supplies and other vents in the building necessary to comply with a desired design level of fresh air. The metabolic CO₂ level is used as an indicator of fresh air. The user interface and output can be viewed on the CD .

As input data one should define the type of components, such as inlets, outlets and overflow. The building leakage can be changed.

The climatic data should also be given as input data: wind speed, wind direction and outside temperature.

The output is given graphically: airflows, CO₂ concentration and energy use for ventilation.



You can find all files for the NavIAQ program on the AIVC CD  and on the NatVent CD.

Installation is easy. A manual is supplied and can be printed out.

European Collaboration on Energy Performance Regulations - ENPER-TEBUC

Many European countries have, in one way or another, a building regulation based on energy performance requirements. It may deal with aspects such as transmission losses of the envelope, ventilation losses, performance of heating and cooling appliances and hot water supply, lighting, ventilation systems, solar gains, etc. and also with comfort aspects such as thermal comfort in summer, indoor air quality, visual comfort, etc.

The background and the political reasons for implementing such new approaches may be different from country to country. These different philosophies may affect the technical approach and the calculation procedures adopted.

The ENPER-TEBUC-project, in the framework of the SAVE-programme of the European Commission, aims to provide an overview of the present situation in European countries with respect to energy performance schemes, and an understanding of the various approaches. Starting from this overview, the project will formulate recommendations for the development of new Energy Performance Regulations (EPR), and will contribute to a convergence of the procedures at European level, as demanded in the proposal for the EC directive on the energy performance of buildings. It will push the member states to adopt energy performance regulations for new and existing buildings, and will form the framework for any further development in this field.

ENPER-TEBUC started on the 1st of April 2001 and will run until the end of September 2003 .

In parallel with this project, a number of international workshops have been organised to disseminate the information gathered by the project partners. The attendance at the first workshop in Brussels, held on the 18th of June, with over 150 participants from all over Europe, showed a great interest in the subject of EPR. Read one of the workshop papers .

Two other international workshops are already planned :

“Approaches for dealing with innovative concepts in EPR”, Paris, Monday, 12th November 2001

“Legal context for, and practical implementation of an EP legislation”, Athens, Tuesday, 5th March 2002

Announcements of the international workshops as well as the results of this project can also be found on the project’s website, Web www.enper.org/.



EnerBuild RTD

The EnerBuild RTD Thematic Network promotes links between key European market actors and the European Commission’s building-related energy RTD activities: the use of synergies between the objectives of industry associations and those of the Commission; and a wider, cost-effective dissemination of the best available energy technologies in the building sector. It aims to advance community, social and environmental objectives while delivering added value to the work of the EU’s leading building researchers; to contribute to economic development; and to strengthen the competitiveness and the technological base of European construction.

EnerBuild RTD has the following objectives:

- To deliver the results of past and current research to potential users in the most important sectors with the greatest dissemination potential, with the overall objective of reducing emissions and improving the energy efficiency of the built environment in Europe,
- To facilitate and encourage collaboration and exchange among EC-supported research projects and researchers,
- To help maintain the technical and industrial content of future European energy-related building research, and to contribute to the identification of future research priorities,
- To form links with relevant targeted research and demonstration actions and other Thematic Networks with a view to maximising the effectiveness of the problem solving effort,
- To minimise overlap and facilitate communications between national and EC-funded activities,
- To encourage the formation of new RTD partnerships between stakeholders in construction including industry, designers, developers and researchers, and
- To evaluate the effectiveness of different strategies and media in disseminating RTD

results and supporting innovation in the European building sector.

View EnerBuild’s newsletters for January 2001 , and August 2001  (cover only) on the CD.

Web <http://www.enerbuild.net>



Final Report of the European TIPVENT Project Available

The TIP-Vent project (February 1999 to January 2001) was funded in part by the European Commission within the framework of the Non Nuclear Energy Programme JOULE IV.

The major aim of the TIP-Vent project was to make a substantial contribution to the creation of better boundary conditions for the application of mechanical ventilation systems with good performances.

The practical actions have been organised through different tasks :

- Achieving a better understanding of the impact of air flow rate on the energy demand of buildings;
- Evaluating the real performances of installed mechanical ventilation systems;
- Analysing the impact of existing and proposed standards and building regulations on the performances of ventilation systems;
- Creating a pre-normative framework that will stimulate the development and the market entry of smart mechanical ventilation designs, systems and strategies;
- Applying / testing the developed concept on a representative range of systems; and
- Developing a number of new innovative ‘smart’ designs for improved performances

The TIP-Vent partners were: ALDES, Basler & Hofmann, BBRI, Bergschenhoek, BSRIA, J&W, TNO and the University of Porto.

The main result of the TIP-Vent project is the so called TIP-Vent source book, which synthesises the outcome of the different tasks. This book, together with the complete collection of task reports, is available on the CD .

Integral Building Envelope Performance Assessment

The idea to initiate an annex on Integral Building Envelope Performance Assessment surfaced in 1993 during an IEA Future Buildings Forum meeting on 'Building Envelopes as Energy Systems'. The annex itself (IEA ECBCS Annex 32) started in 1996 with research bodies from twelve countries participating, and a two subtasks structure: A on the rationale and B on applications .

The performance concept

The term 'performance' concerns each quality of a building assembly that can be quantified, is predictable during the design stage and controllable during and after construction. Their formulation starts ahead of the building at level one. Buildings form level two. Building elements belong to level three, etc. In most cases, performances have a top-down linkage. Also horizontal links exist. They may even impose conflicting choices.

Achievements

The annex held eight three days meetings. It produced 46 subtask A and 56 Subtask B papers, and drafted three final reports that reflect the ideas generated. The Subtask A final report, 'Building Envelopes in a Holistic Perspective' first explains the fit for purpose approach. Then matching between user needs and functional requirements is discussed, followed by the concept of quality levels. The report ends with the translation of functional requirements into performances, performance assessment and risk management. The two subtask B reports, one on 'Advanced Envelopes' and the other on 'Traditional and Retrofitted Envelope Optimization', concentrate on the application of methodology for envelope design and cost optimization.

Web www.bwk.kuleuven.ac.be/bwf/projects/annex32/frameanx.htm

Reports can be ordered from:

Email bookshop@ecbcs.org. Prices . A leaflet about the project is also available in English , or Dutch .

Demonstrating Automated Fault Detection and Diagnosis Methods in Real Buildings

This international research programme (IEA ECBCS Annex 34) has recently been completed and a final report produced . The objective of the Annex was to develop HVAC fault detection and diagnosis tools, which are close to commercial products. The approach was to design a number of different computer-based demonstration systems that could be interfaced to HVAC processes in real buildings. By monitoring the operation of these demonstration systems, researchers were able to test a variety of fault detection and diagnosis methods and techniques in a real environment, find possible shortcomings and obtain new ideas for further development.

Almost fifty industrial partners, including controls and plant manufacturers, construction companies, and building owners and operators, participated in the thirty demonstrations that were completed. The final report describes each demonstration system, identifies key issues associated with successful practical application, and examines the potential for commercial exploitation. The programme of research, which involved research engineers from eleven countries, was completed in under four years. Annex 34 was coordinated through the IEA's Energy Conservation in Buildings & Community Systems Programme. Web www.ecbcs.org/annexes/annex34.htm

Retrofitting of Educational Buildings

The newsletters for this project, ECBCS Annex 36, for September 2000  and April 2001  are available on the CD. Web www.annex36.bizland.com

Low Exergy Systems for Heating and Cooling of Buildings

The long term planning perspective is to move towards a sustainable society (Rio conference, Brundtland report). Consequently, future buildings should be planned to use or to be suited to use sustainable energy sources for heating and cooling.

The general objective of the IEA ECBCS Programme's Annex 37 (2000 - 2003) is to promote the rational use of energy by means of facilitating and accelerating the use of low valued and environmentally sustainable energy sources for the heating and cooling of buildings. The specific objectives are:

- to investigate the technical and market potentials for replacing high valued energy (e.g. fossil fuels and electricity) by low valued

energy sources, and to assess its impact on the global resources and environment;

- to assess existing technologies and components for low exergy heating and cooling in buildings, to enhance the development of new technologies and to provide the necessary tools for analysis and evaluation of low exergy systems;
- to develop strategic means for the introduction of low exergy solutions in buildings by case studies, design tools and guidelines. Web www.vtt.fi/rte/projects/annex37/

LowEx News for September 2000 , January 2001  and June 2001  are on the CD.

Solar Sustainable Housing

This project represents a joint venture between IEA Energy Conservation in Buildings and Community Systems (ECBCS) Annex 38 and IEA Solar Heating and Cooling (SHC) Task 28 . The objective is to help achieve in participating countries a significant penetration of solar sustainable housing in the housing markets (i.e. >5%) by the year 2010, by providing builders and institutional real estate investors with:

Good examples of built projects with proven successes;

- Hard facts to make cost/benefit decisions on the mix of solar and conservation strategies; and
- Guidance to improve energy, environmental and cost performance of their own designs.

The scope of this Annex includes:

- Housing types: Multi-family, row, duplex and detached housing;
- Solar technologies : Passive, active and PV solar use, natural cooling and daylighting involving the building envelope and structure;
- Conservation technologies : Super insulation and windows, thermal bridge avoidance, ventilation and heat recovery systems; and
- Spin-off technologies : For retrofitting existing buildings.

Web <http://www.iea-shc.org/task28/index.htm> and Web <http://www.ecbcs.org/Annexes/annex38.htm>

Commissioning of Building HVAC Systems for Improved Energy Performance

The objective of the IEA ECBCS Programme's Annex 40 which started in 2001 is to develop, validate and document tools for commissioning building HVAC systems. These tools will include guidelines on commissioning procedures and

recommendations for improving commissioning processes, as well as prototype software that could be implemented in stand-alone tools and/or embedded in building energy management systems (BEMS).

It is anticipated that some of the procedures developed in the annex will be transferred to standardization bodies and could eventually become the basis for new commissioning regulations.

The work performed in the annex will focus on HVAC systems and their associated control systems, but will take into account, when appropriate, interactions with other systems and with the building shell.

Web <http://www.ecbcs.org/Annexes/annex40.htm> and Web <http://eneaweb.cstb.fr/annex40/>

The Energy Technology Data Exchange (ETDE) World Energy Base

ETDE World Energy Base (ETDEWEB) is the Web version of the IEA Energy Technology Data Exchange's (ETDE) Energy Database containing over 850,000 records collected from 1995 forward. The work of ETDE's 18 member countries and key international strategic partners has resulted in a collection of more than four million records (bibliographic citations and abstracts) of published energy science and technology information. Worldwide coverage of global climate change, fossil fuels, and nuclear energy is included through alliances with IEA Coal Research and the IAEA's International Nuclear Information System. ETDEWEB also includes links to over 80,000 full-text documents. Founded as an IEA agreement in 1987, ETDE debuted ETDEWEB in late 1999. Access to ETDE's database and ETDEWEB is restricted to member

countries. ETDE's new tool, Energy Information Sources (EIS), however, is openly available. It offers links to energy-related internet sources in six categories: Business & Industry, Databases & Information Systems, Data Compilations and Statistics, Government Organizations, Research Institutions and Programs, and Subject Gateways.

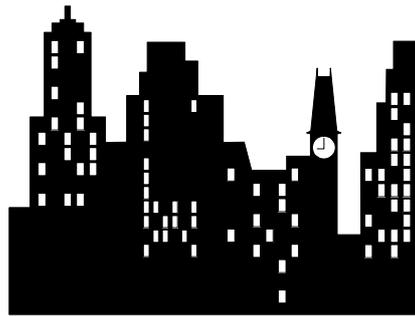
Look on the AIVC CD for a few sample documents found in the ETDE database of possible interest to the AIVC community, and the latest ETDE Newsletter.

ETDE Web www.etde.org/etdeweb;

EIS Web www.etde.org/infolinks/links.html

Building Integrated Photovoltaics

Building Integrated Photovoltaics (BIPV) combine electricity generation with other building functions such as roof, façade or shading components, replacing conventional systems. Some BIPV systems may also be designed for the co-generation of heat and power such as PV integrated into ventilated double skin façades, where warm air is collected from behind the PV modules for ventilation pre-heat.



The co-generation of heat and power offers the potential for further energy savings. As part of an investigation (1,2,3) supported by the UK DTI and the EC JOULE R&D programme, a prototype ventilated façade was installed on a test cell at the PASSYS test site at BRE (UK Building Research Establishment) Scottish Laboratory. The concept of the façade is a direct response to future trends in building design:

The façade is able to respond to and utilise the available solar energy;

The glazed part of the façade and semi-transparent PV modules allow high levels of natural daylighting and maximum external views, whilst blinds within the façade control glare;

The façade can be used to drive natural ventilation, utilising the stack effect for summer cooling and winter ventilation pre-heat. Ventilation at the rear of the crystalline PV modules helps reduce operating temperature and enhance electrical efficiency. Alternatively, the façade may be closed off in winter, to provide an insulating buffer zone.

The main aims of the project were two-fold: to evaluate (i) the potential of the thermal energy generated within the façade to contribute towards a natural ventilation system, and (ii) the influence of natural ventilation on the PV operating temperature.

The results of the monitoring exercise are presented on the CD.

The airflow regime within the façade is predominantly driven by wind, although buoyancy effects due to solar gains are discernible. The consequence of this is that there is generally always some air movement within the façade. Heat transfer by conduction to the façade from the test room can also be recovered; during the winter this can be a significant part of the energy balance. Ove Arup have modelled the façade successfully for buoyancy driven flows, but further model development work is required to extrapolate the results to predict the performance of "real building" façade designs. Natural ventilation has a beneficial effect on PV operating temperatures in the façade, with average temperatures ~ 25°C.

Within an EC JOULE project, PV-Hybrid-PAS(4), a standard scheme for the performance evaluation of such hybrid PV building components, was developed using PASSYS test cells. Whilst emphasis was given to procedures for the assessment of thermal and electrical performances of these elements, other aspects, such as maintenance and durability, weather tightness, ventilation, and daylighting were considered. The use of similar test facilities across Europe under the aegis of the PASLINK EEIG provided high quality data for scaling and replication studies to different building types, and climates. Results and further information: Web www.paslink.org

The results of the PV-HYBRID-PAS project are available on the CD. Contact passlink@bbri.be for more information. References for this article can be found on the CD also.



STANDARDS AND REGULATIONS

The AIVC Standards Report: A Review of International Ventilation, Airtightness, Thermal Insulation and Indoor Air Quality Criteria

The purpose of this review is to provide a reference document for all those involved in building ventilation and air leakage research and practice. It attempts to summarise available airtightness, minimum ventilation rate and indoor air quality requirements, standards, codes of practice and regulations, and to determine the nature and type of thermal insulation requirements and the rationale behind the data outlined in this report. Attempts have also been made to normalise the data, where appropriate to enable comparisons to be undertaken.

This report will be featured in one of the forthcoming AIVC CDs. See the subscription form on page 15.

European Standardisation – Technical Committee 156 Ventilation for Buildings

Within the European Union, standards related to ventilation for buildings have been prepared by the Technical Committee 156 of the CEN (European Committee for Standardisation) since 1989.

The fields covered by this committee are: Symbols units and terminology; Requirements for component characteristics; Dimensions and requirements for strength and leakage of duct components; Performance testing of ventilation products and components; Design criteria for the indoor environment; Design and dimensioning of systems; Calculation methods for ventilation systems; Performance testing of ventilation systems; System performance; Cooling load calculation; Instrumentation for ventilated spaces; and Fire precautions for air distribution systems in buildings.

The status of the different documents is not the same for all of them. Ten documents (7 standards, 1 pre-standard and 2 technical reports) have already been published, 2 others have been ratified and about 40 are under approval or development (as of July 2001).

Find CEN at: Web http://www.cenorm.be/standardization/tech_bodies/cen_bp/workpro/tc156.htm

An International Standard on Ventilation Rate Measurement Using the Tracer Gas Technique

Subcommittee 6 "Indoor Air" of the ISO's TC 146 develops international standards for the measurement of indoor air quality. These measurements are used, for example, to investigate the causes of indoor environment problems. In order to decide on proper remedial measures, the ventilation rates need to be known as well. Therefore the subcommittee has agreed to develop an international standard on the topic. The main objectives of the ventilation rate measurements carried out using the standard are as follows:

- Determination of the air change in parallel with determination of pollutant gas concentrations in a zone, with the purpose of determining the emission rate of the pollutant gas, or correlating the measured pollutant gas concentration with the measured air change.
- Determination of the air change together with pollutant gas emission measurements (e.g. to check the fulfilment of guide values in building investigations).

The proposed standard is based on ISO 12569 "Thermal performance of buildings – Determination of air change in buildings - Tracer gas dilution method", which gives a general overview of principle ventilation rate measurements without details. The proposed standard, however, describes a detailed measurement procedure. A draft for the standard has already been prepared (ISO/WD 16000-7 Indoor air — Part 7: Ventilation rate measurement, available on the AIVC CD). The draft will be further developed in the subcommittee's Work Group 6. For more information, please contact the convenor of WG6, Mr. Jorma Säteri (EMAIL jorma.sateri@sisailmayhdistys.fi).

BOOKSHOP

AIVC Electronic Publications

The first selection of AIVC electronic publications is available here. Many more will follow in forthcoming issues of AIR – so watch this space!

Our current selection reflects the considerable development shown as the AIVC project has progressed – compare the concise early technical

note "Techniques and instrumentation for the measurement of air infiltration in buildings - a brief review and annotated bibliography" (TN 10) with its detailed successor "Air flow patterns – measurement techniques" (TN 34). Many AIVC publications can still be obtained in printed format – check the AIVC website for details: Web www.aivc.org.

This CD contains seven AIVC technical notes, two annotated bibliographies, four literature lists and the proceedings of the 19th AIVC Annual Conference.

In forthcoming issues we aim to include the AIVC Guide to Ventilation, Improving Ductwork, Acoustics and Ventilation, the Proceedings of the 20th AIVC Annual Conference, and many more publications, both older and newly published.

Airbase

View a cross section of records (bibliographical citation and abstract) from the AIVC's bibliographical database "Airbase" in Microsoft Access format (MS Access users only). The interface will be improved, with even more user-friendly functions and will be visible on the AIVC website from November 15th onwards

AIR Newsletters - Back Issues

Read AIR issues for June and March 2001 on the CD. Issues back to December 1995 can be found on the web at:

Web www.aivc.org/air_backissues.html

The IEA's Energy Conservation in Buildings Programme - Bookshop

This web-based bookshop acts as an outlet for all the ECBCS Implementing Agreement's publications. Forty 3-5 year research projects have taken place since its establishment, over thirty of which are now completed. In order to fulfil the International Energy Agency's remit for wide dissemination of research results, the final reports and other publications of this programme are available to all. Click for a list of current bookshop publications. Web www.ecbcs.org

Energy and Climate in the Urban Built Environment

Edited by Mat Santamouris, University of Athens, Greece, James and James Science Publishers (Web www.jxj.com), 2001

In our days it is well accepted that urbanization leads to a very large increase in energy use. Recent analysis showed that a 1 % increase in the per capita GNP leads to an almost equal (1.03), increase in energy consumption. However,

as reported, an increase of the urban population by 1 % increases the energy consumption by 2.2 %, i.e., the rate of change in energy use is twice the rate of change in urbanization.

Increasing urbanization and industrialization have deteriorated the urban environment. Deficiencies in development controls have important consequences on the urban climate and the environmental efficiency of buildings. The size of housing plots has been reduced, thus increasing densities and the potential for traffic congestion. The increasing number of buildings has crowded out vegetation and trees.

The continuously increased urbanization, combined with the degradation of the urban climate and the recent upsurge of concern for the environment as well as recent technological developments in the field of new energy technologies, define the major priorities and considerations for urban buildings.

This new book presents, in a very comprehensive way, the impact of the urban environment on the energy consumption and global environmental quality of buildings. The book presents all scientific aspects related to urban climatology and its impact on buildings, such as the heat island and the canyon effect. It discusses scientific aspects related to the thermal balance of cities, the flow patterns and characteristics of the air flow in canyons and in general in the urban environment, the role and impact of materials, the role of green spaces, and more. Many case studies and interesting results from all round the world are presented.

The book is mainly the result of the European SAVE program POLISTUDIES, carried out by the University of Athens, University of Salonica, ENTPE Lyon and University of Stuttgart, Germany. The work has been coordinated by M. Santamouris of the University of Athens.

The Role of Indoor Building Characteristics as Exposure Indicators and Risk Factors for Development of Bronchial Obstruction in Early Childhood,

PhD Thesis by Leif Oie, Norwegian University of Science and Technology, 1998

The objective of the study was to investigate the role of building characteristics as exposure indicators and risk factors for development of bronchial obstruction during the first two years of life.

A matched case-control study was carried out based on a cohort of 3754 children born in Oslo during 1992 and 1993 and followed for two years. The case series consisted of 251 children with

bronchial obstruction and the control series was one-to-one matched by the date of birth. Exposure assessment was performed in parallel for all pairs within one to three weeks after inclusion.

This dissertation revealed an independent association between dampness problems (adjusted odds ratio OR: 3.8; 95% confidence interval CI: 2.0-7.2) and the presence of PVC-flooring (adjusted OR: 1.89; 95% CI: 1.14-3.14) and the development of bronchial obstruction in children followed from birth to two years of age. Further analysis indicates an exposure-response relation between the assessed amount of PVC and other plasticizer-containing surface materials and the risk of bronchial obstruction. Hence, possible direct causal agents could be plasticizers emitted from PVC plastic materials. One third of the residences are under-ventilated according to the current national building code (minimum average air change rate 0.5 h^{-1}) and evidence is provided for a decrease in air change rates as a result of new building standards, construction



techniques, and the implementation of energy conservation measures. Still, no direct association between residential air change rate and the development of bronchial obstruction was observed. However, the investigation provided evidence supporting the hypothesis that low air change rate increases the effect of airborne indoor pollutants generated indoors. Particulate matter is finally identified as an important carrier of phthalates which is suspected to induce bronchial hypersensitivity. Hence dust and particles provide an as or more important exposure path than vapor phase exposure to phthalates.

This publication consists of six papers published in international review journals; the references for these papers can be found on the CD .

Reliable Control of Interstitial Condensation in Lightweight Roof Systems

Calculation and Assessment Methods, PhD Thesis by Arnold Janssens, Ghent University, Belgium

The general objective of the research was to develop calculation and assessment methods to improve the reliability of condensation control systems in lightweight roofs, considering the uncertainty of achieving continuity of airtightness in building practice. An assessment method has been developed based on a stochastic approach to moisture performance analysis and on concepts of industrial risk analysis. To predict the thermal and moisture performance of lightweight systems, a two-dimensional transient model has been developed for the combined heat, air and water vapour transfer in building components. The model allows for a two-domain description in terms of porous media and air channels.

The calculation method has been applied to produce a better understanding of the effects of air movement and discontinuities on the performance of lightweight roofs. The development of the assessment method involves the definition of design climate values for the evaluation of condensation risk due to air leakage, the definition of limit state values to assess the risk and the use of 'redundant' protective measures to reduce the risk. The research produces tools and recommendations for the design of lightweight roof systems with reliable control of interstitial condensation.

This publication is available on the AIVC CD .

Quality in Relation to Indoor Climate and Energy Efficiency

An Analysis of Trends, Achievements and Remaining Challenges, PhD Thesis by Peter Wouters, BBRI, Belgium

The thesis focuses on an analysis in terms of quality of the indoor climate and energy efficiency of buildings and the interaction between both aspects. Particular attention is given to trends, achievements and remaining challenges.

Quality is defined by the stated and implied needs of the customers and of society. A critical analysis is made of major developments over recent decades and this in relation to stating the needs concerning indoor climate and energy efficiency. Also developments in performance prediction and challenges in relation to standards, regulations and project specific requirements are studied.

A crucial part of the thesis is an analysis of the role of technology, whereby 14 technologies are evaluated many of which dealing with ventilation

and indoor air quality, e.g. natural ventilation, mechanical ventilation, airtightness of buildings, airtightness of ductwork, night ventilation for passive cooling, and ventilation by cooker hoods.

This analysis indicates that technology plays a crucial role. Finally, the role and the potential of an Energy Performance Regulation is discussed with particular emphasis on the challenges for such regulations.

This publication is on the CD .

Humidity Control in Outdoor-air-ventilated Crawl Spaces in Cold Climate by Means of Ventilation, Ground Cover and Dehumidification

PhD Thesis by Jarek Kurnitski, Helsinki University of Technology, HVAC-Laboratory, Report A3, Espoo 2000

This study shows that acceptable moisture conditions in crawl spaces may be achieved by the optimal selection of ground cover and ventilation. The field measurements were carried out in five crawl spaces, where alternative ventilation solutions, ground cover and dehumidification were tested. The measured data were used to develop a new crawl space model with features for heat and moisture transfer in a modular simulation environment, which was used for parametric simulations. The acceptability of moisture conditions was assessed by mould growth analyses. The results show that ventilation system and air change rate are not the key factors in the crawl space moisture balance. To increase the crawl space temperature and reduce relative humidity during the most critical period in the summer, it was necessary to insulate the cold ground effectively with a sufficiently thick ground cover. The solutions concerning ground cover and air change rates providing acceptable climate in crawl spaces are given.

Contribution to Particle Deposition Study: Wall Surface and Ventilation Roles

PhD Thesis by Marc Abadie, Laboratoire d'Etude des Phénomènes de Transfert Appliqués au Bâtiment (L.E.P.T.A.B.); Pôle Sciences et Technologie – Université de La Rochelle, France, EMAIL marc.abadie@univ-lr.fr

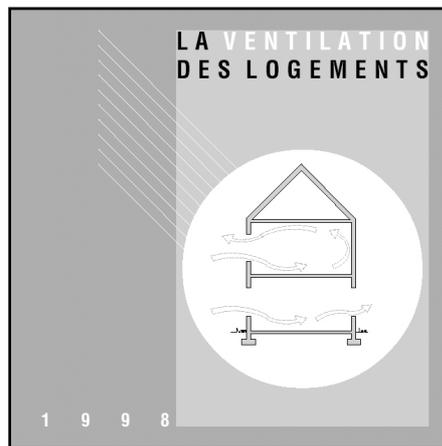
The study is in line with indoor air particle pollution and more precisely in the development and perfecting of modelling tools. The first part starts with a state of the art of indoor particle pollution knowledge. Indoor air particles are listed and classified depending on their origins and sizes. The difficulties of predicting the particle

movement are put into relief by the study of numerous elementary forces acting on particles. The second part is dedicated to the development of an indoor concentration prediction model in a monozonal room. Air particles are considered from a global point of view, particle pollution is deduced by identifying interactions between the entire polluted air and the building envelope. An experiment made on a scale model has been designed to study the particle deposition on wall textures. This experimental study permits us to quantify the deposition and to elaborate a classification of wall textures versus particle pollution. The last part deals with numerical simulations of particle transport in confined flows such as those encountered in buildings. The development of the LEPTAB particle dispersion numerical model permits us to estimate the particle trajectories in three-dimensional space. Our contribution consists of introducing wall - particle interaction laws to take into account real building textures. These wall laws are based on the results of the experimental study made on a scale model. Perspectives on the development and on the validation of the global model and on the improvement of the particle dispersion numerical code are presented and discussed in the conclusion.

Find the thesis on the CD  (in French).

Energy and Buildings

The 2001 contents for this respected journal are listed here .



Publications Concerning Ventilation from the Walloon Region

Within the framework of the rational use of energy in 1998, the Ministry of the Walloon Region (Direction of Energy – Belgium) published a number of booklets. They have been written by the Belgian Building Research Institute and are

aimed at building technicians and householders interested in home building or renovation.

“Ventilation in dwellings”  (in French)

The context and the motivations for good indoor air quality and ventilation in dwellings are developed, and the basic systems are described: natural ventilation, mechanical ventilation, intensive ventilation, ventilation in the kitchen and in special rooms, etc., paying special attention to energy performance and the requirements of the Walloon Region.

“Condensation and mould growth”  (in French)

Condensation and mould growth problems have been increasing in Belgian dwellings for the last 25 years.

To find solutions, one must investigate the conditions of the emergence of these phenomena.

These conditions are examined in the booklet: air humidity, sources of humidity, temperature factors, and so on.

Recommendations are made for limiting the problems of condensation and mould growth.

Web <http://mrw.wallonie.be/dgtre/>

Home Energy

Home Energy magazine is published by a US based non-profit organization whose mission is to provide objective and practical information on all aspects of home performance, from residential energy conservation, to indoor air quality, to building more energy efficient homes.

The magazine emphasizes a whole-building approach - comfort, health and safety, energy efficiency, durability, and affordability - in its coverage of heating and cooling systems, appliances, the building envelope, materials, new technologies, and best practice. Interesting articles in relation to ventilation and indoor air quality are regularly published, e.g. concerning ductwork airtightness.

The website Web www.homeenergy.org contains a lot of information and certain articles are available for download.

MEETINGS AND EVENTS

Second International One-day Forum on Hybrid Ventilation

“An Integral Solution to Ventilation, Health and Energy”, held in Delft, 14 May 2001

Ventilation in buildings has undergone a clear evolution in recent years. Advanced natural as well as advanced mechanical ventilation systems have been introduced and will be further

developed and applied. Demand controlled ventilation, high efficiency heat recovery and advanced controlled natural ventilation are the keywords.

The next step in these developments is hybrid ventilation systems in which the best of natural and mechanical ventilation are combined in a two-mode system. The operating mode varies according to the season and within individual days; thus the current mode reflects the external environment and takes maximum advantage of ambient conditions at any point in time.

At the above forum, and within the framework of the 6th meeting of IEA ECBCS Annex 35 "Hybrid ventilation in new and retrofitted office and educational buildings" the intermediate results of the Annex 35 work were presented to an audience of about 130 architects, consultants, researchers, manufacturers of ventilation systems and builders.

The day's program consisted of eleven presentations, which gave a broad overview of hybrid ventilation, from the governmental policy of energy savings and health effects, the state-of-the-art of hybrid ventilation and the classification of hybrid ventilation systems, to the architectural point of view on hybrid ventilation and the control strategies and design aspects. In the afternoon program results were shown of measurements on a hybrid ventilation system in practice and an overview was given of Norwegian buildings with hybrid ventilation. The impact of building regulations and the commissioning of systems were presented at the end of the day. The forum was closed with a discussion.

The main conclusions of the day were that the development of real hybrid ventilation systems is still in its infancy, although the first results are promising. In particular the control aspects of hybrid systems need further development. An improvement in control systems and control strategies, and a price reduction for systems and components is needed to make hybrid ventilation

a success. The Forum's technical papers are available on the CD . Web www.civil.auc.dk/hotel/hybvent/



The EPIC 2002 AIVC Conference

"Energy Efficient and Healthy Buildings in Sustainable Cities", to be held in Lyon, France

The 23rd AIVC conference will be held in conjunction with the 3rd EPIC conference, from 23rd to 26th October 2002 in Lyon, France.

EPIC is the European Conference on Energy Performance and Indoor Climate in buildings

The meeting builds on the experiences of the earlier events organised in 1994 and 1998, and now merges the efforts with the annual conference of the AIVC on ventilation and indoor air quality research. The conference aims at confronting views from researchers, industry, architects, engineers and policy makers on the future of buildings and their urban setting: how to assess the performances of buildings regarding energy efficiency and indoor climate conditions and make them perform better without harming the environment. Therefore oral and poster presentations will be combined with more specialised workshops on selected topics such as climate façades, sustainable urban planning, hybrid ventilation, IAQ, ICT, etc.

EPIC2002AIVC is a joint organisation of INIVE EEIG (OA of AIVC) and ENTPE, Ecole Nationale des Travaux Publics de l'Etat, in collaboration with University of Athens, Université de La Rochelle, CSTB, CETIAT and BBRI.

The venue is the HILTON Lyon hotel.

More info and call for papers are on the flyer (on the CD ) or at Web <http://epic.entpe.fr> or Web www.aivc.org

The deadline for the submission of abstracts is 15th November 2001.

Intelligent Ventilation Systems Workshop

Second International Workshop, Brussels

Nowadays, there is an increased awareness that correct indoor climate conditions can only be guaranteed if use is made of ventilation systems. There is also a growing concern for the environmental impact of buildings and in particular the pollution due to energy use. In Europe, some of the present standards and regulations already pay interest to the issues of indoor air quality and energy efficiency. However, in most countries there is only a limited stimulation for the use of advanced ventilation systems.

This workshop has as its main objectives the exchange of ideas and information in relation to intelligent ventilation systems, and identification of priority areas for further action in relation to Energy Performance Regulations. The following topics will be discussed: what are the trends in the ventilation systems/strategies under development? How are these concepts treated in the framework of EPR (Energy Performance Regulation)? What is important in such regulations in order to accept new innovative technologies?

This workshop will be held in Brussels on March 21-22, 2002. For more info, please contact: Email nicolas.heijmans@bbri.be

Forthcoming Conferences

A list of forthcoming conferences of interest to AIR readers is available here .

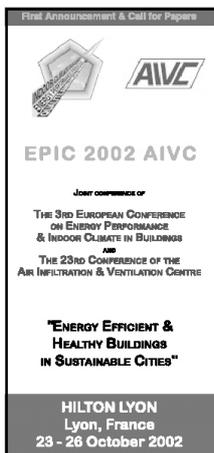
Web www.aivc.org

POLICY AND PROGRAMMES

New European Directive on Energy Performance of Buildings

The European Commission has issued a proposal for a new Directive on Energy Performance of Buildings, to be adopted by the European Parliament and the Council. The main topics covered are:

- A) Establishment of a general framework of a common methodology for calculating the integrated energy performance of buildings.
- B) Application of minimum standards for energy performance in new buildings and in certain existing buildings when they are renovated.
- C) Certification schemes for new and existing buildings on the basis of the above standards and public display of energy performance certificates and recommended indoor temperatures and other relevant climatic factors in public buildings and buildings frequented by the public.



D) Specific inspection and assessment of boilers and heating/cooling installations.

This directive will enforce the member states to develop appropriate national or regional building regulations.

Full text available on the AIVC CD  or at Web http://europa.eu.int/eur-lex/en/com/reg/en_register_121020.html.

Tripartite Initiative Launches an Agenda for Sustainable Construction in Europe

FIEC, through its 31 national federations in 24 countries (14 countries of the European Union, 3 of the European Free Trade Association, Bulgaria, Cyprus, the Czech Republic, Hungary, Poland, Romania, Slovakia and Turkey), represents the interests of construction firms of all sizes and all specialities. With 1.9 million enterprises and some 11 million operatives, the construction industry is Europe's largest industrial employer, accounting (in 1999) for 7.5% of total employment and 28.1% of industrial employment in the EU. It also accounted for 9.7% of GDP and 47.6% of gross fixed capital formation. Some 26 million workers in the EU depend, directly or indirectly, on the construction sector.

A tripartite working group with participants drawn from the European Commission, Member States and Industry has published a report aimed at raising the sustainability of construction activities and the built environment in Europe.

The decision to draw up and publish this report came as a direct consequence of the conclusions of the Council of Industry Ministers on 7th May 1998 in response to the Commission's Communication¹ on the Competitiveness of the construction industry adopted on 4th November 1997.

The terms of reference for the report were "to develop strategies and recommendations aimed at promoting more sustainable construction in a European context. In the first instance, before addressing further issues, priority will be given to developing strategies for environmentally friendly construction materials, energy efficiency in buildings and construction and demolition waste management."

Initially three task groups were set up to draft reports on these three issues whilst the working group drafted its report on strategies and recommendations aimed at promoting more sustainable construction in a European context.

The "cradle to grave" aspects linked to the creation, use and disposal of built facilities taken together constitute major environmental impacts. Construction activities consume more raw

materials (as much as 50%) than any other industrial sector. The built environment moreover, accounts for the largest share of greenhouse gas emissions (approaching 40%) in terms of energy end usage. Measured by weight, construction and demolition activities also produce Europe's largest waste stream (between 40% and 50%) most of which though, is recyclable.

This implies that the construction industry – and the sustainability of its products: principally buildings – in order to become more sustainable in the long term, faces an environmental challenge that, in absolute terms is greater than that of any other industrial sector.

The report, completed in May 2001, traces recent developments following the Earth Summit in Rio de Janeiro in 1992, through the Treaty of Amsterdam – which introduced into the EU Treaty the concept of the integration of environmental protection requirements into the definition and implementation of Community policies and activities – to the Helsinki and Gothenburg summits in 1999 and 2001 respectively.

It has as its principal objective, the review of current developments in the Member States and the promotion of a "European Agenda" for sustainable construction thereby constraining the tendency of Member States to increasingly develop disparate and un-coordinated plans of their own. Viewed from a positive standpoint, it is hoped that this report will serve as a focal point for sustainable construction policies and strategies in Europe and will encourage most, if not all Member States and Accession Countries, to develop their own national plans and strategies for a sustainable construction agenda.

In addition to the recommendations of the three Task Groups, the report contains recommendations for further actions on topics such as the whole life costs of construction; sustainable procurement; sustainability performance indicators; national plans and European programmes; software tools; education and awareness raising; research and development.

The appendices to the report contain copies of national plans for sustainable construction in 5 member states, Finland, Ireland, Netherlands, Sweden and the UK as well as a bibliography for reference and further reading.

The full text of the reports may be downloaded at the following websites: Web <http://www.fiec.org> or the European Commission's website Web <http://www.europa.eu.int/comm/enterprise/construction/index.htm>

The report will also form the basis of the European construction industry's contribution to

the forthcoming Earth Summit (RIO+10) in Johannesburg in September 2002.

For further information please contact: Email: info@fiec.org web: www.fiec.org. The full document "Competitiveness of the Construction Industry" is available on the CD .

CIB - The International Council for Research and Innovation in Building and Construction

CIB is the international association that provides a global network for international information exchange and collaboration in research and innovation in building and construction. CIB supports improvements in the building process and in the performance of the built environment.

The CIB programme covers technical, economic, environmental, organizational and other aspects of the built environment during all stages of its life cycle. CIB addresses all steps in the process of basic and applied research, documentation and transfer of research results and the implementation and actual application of them in construction practice.

CIB Members are organizations and individuals active in the research community, industry, government and education who nominate experts to participate in a network of approximately 60 scientific Commissions.

These approximately 6000 experts worldwide from approximately 600 different organizations exchange the latest information, organize workshops, seminars, symposia and conferences and publish proceedings, technical analyses, state-of-the-art reports and practice recommendations.

In the paper "CIB Areas and Priority Themes"  the 60 current CIB Task Groups and Working Commissions are listed and an indication is given as to what extent those are active in the defined nine CIB Areas of Scientific Interest and to what extent they are expected to contribute to the defined CIB Themes.

Of four selected commissions of special relevance to the issue of ventilation in buildings a more elaborate description is included in the paper "Examples of CIB Commissions" .

One such CIB theme is "Sustainable Construction". An indication of all CIB activities related to this theme is given in the paper "CIB and Sustainable Construction" . Many of those activities are based upon a recently defined conceptual framework on Sustainable Construction that is included in the publication "Agenda 21 on Sustainable Construction" .

Web www.cibworld.nl

LATEST NEWS

PhD Studentship on Natural Ventilation

A PhD studentship is currently available in the School of the Built Environment at Nottingham University, UK. The study is concerned with the design of natural ventilation stacks with emphasis on unsteady wind effects. It will involve experimental studies in a wind tunnel and application of an existing theoretical model (see www.nottingham.ac.uk/sbe/research/previous.htm for details of previous work).

Informal enquiries (and to check that the studentship is still available) should be made in the first instance to David Etheridge, david.etheridge@nottingham.ac.uk, preferably before 31 October 2001.

22nd AIVC Conference

The best paper award goes to J. Palmer for his paper on "AIRLIT-PV: Demonstrating an innovative building facade component".

The best poster award goes to S. Berthin for his poster on "Very low pressure fan for natural ventilation assistance".

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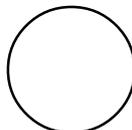
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