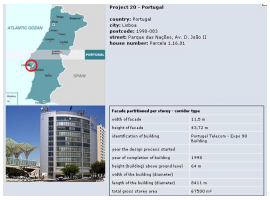
Intelligent Energy Europe

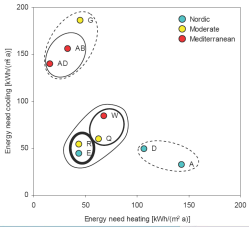
Project Fact Sheet

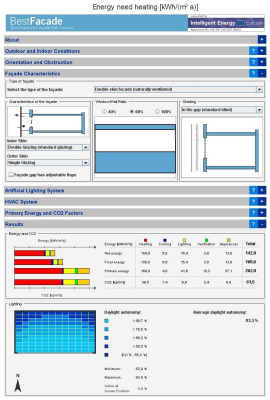
Created/updated: December 2007

Best Practice for Double Skin Façades (BESTFACADE)

Programme area:	SAVE
Status:	Finished
Coordinator:	Christian Schiefer MCE Anlagenbau Austria GmbH & Co E-mail: christian.schiefer@mce-gt.at Tel: 0043 1 610 36 – 268
Partners:	Graz University of Technology, Institute of Thermal Engineering, Austria Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Institute for Building Physics, Germany National and Kapodistrian University of Athens, Group of building environmental studies, Greece C. Kiossefidis S.A., Greece ISQ-Instituto de Soldadura e Qualidade, Portugal Ecole Nationale des TPE-Laboratoire Sciences de l'Habitat-CNRS-DGCB, France Lund University, Sweden Belgian Building Research Institute (BBRI), Belgium Reynaers Aluminium N.V, Belgium WSP Sverige AB, Sweden Skanska Sverige AB, Teknik, Sweden
Website:	http://www.bestfacade.com
Objective:	The BESTFACADE project actively promotes the concept of well-performing double skin façades.
Benefits:	A best practice guideline of double skin façades has been created.
Keywords:	Double skin façade, energy efficiency, design guide, assessment method
Duration:	01/01/2005 – 31/12/2007
Budget:	€ 1.450.318 (EU contribution: 50%)
Contract number:	EIE/04/135/S07.38652







Short description

Double skin façades have become a major architectural element in office buildings over the last 15 years. The double skin façade can provide a thermal buffer zone, solar preheating of ventilation air, energy savings, sound protection, wind protection and pollutant protection with open windows and night cooling. Commercial buildings with integrated double skin façade can be very energy efficient buildings with all the good qualities listed above.

However not all double skin façades built in the last years perform well. The BESTFACADE project actively promotes the concept of well-performing double skin façades. Different media have been produced to supply the target group (architects, designers, consultants, façade industry, HVAC industry, building industry, investors, building owners and operators) with a common basic scientific, technical and economic knowledge on double skin façades. This allows the target group to design, choose, manage, use and maintain double skin façades.

Expected and/or achieved results

- A best practice guideline of double skin façades has been compiled. Using this guideline designers and investors can avoid application of non relevant concepts of double skin façades performing worse than traditional façades.
- A centralised information system database containing data collected from a survey of double skin façades built in the European Union has been established and is available on the project web site. The state of the art of double skin façades in different countries and climatic regions can be found in the WP1 report.
- An assessment method has been developed, which can be used in the further development of the assessment methods of the EPBD. With this method the thermal and visual behaviour and the energy performance of a double skin façade can be calculated with adequate accuracy for assessments of potentials and a prediction of the efficiency of the façade technology can be derived. The method was presented to the relevant CEN and ISO standardisation committees and is the basis of a new work item (ISO TC 163).
- An internet-based pre-design tool allows designers and investors to study the impact of different façade systems on the energy demand and visual characteristics.
- Benchmarks developed allows the users and operators to compare their energy consumption levels with others in the same group, set future targets and identify measures to reduce energy consumption.
- A façade energy certification method has been proposed.
- Non-technological barriers to DSF have been identified and solutions to overcome them are presented. These non-technological barriers are more difficult to overcome due to the fact that the factors which govern them are not objective and differ from country to country. An analysis was carried out of non-technological barriers such as legal, financial, sociological-behavioral and institutional aspects.
- The project results have been disseminated by different strategies, like website, CD-ROMs, workshops and presentation at conferences.

Lessons learnt

- Many modern office buildings have highly glazed façades. However, their performance is being questioned, especially in terms of energy use and indoor climate. Therefore more and more of these buildings are being built with double skin façades (DSF), which can provide improvements such as a thermal buffer zone, energy savings, wind protection with open windows, fire protection, aesthetics, solar preheating of ventilation air, sound protection, night cooling and a site for incorporation of PV cells. But not all built DSF perform well. Far from it, in many cases large air conditioning systems have to compensate for summer overheating problems and the energy consumption exceeds the intended heating energy savings. Therefore the architectural trend has in many cases unnecessarily resulted in a step backwards regarding energy efficiency and the possible use of passive solar energy.
- Unfortunately only little measured data of energy demand and temperatures in the gap and the rooms behind was available, because building managers are not easily willing to give away such sensitive data. Nevertheless the established database of buildings gives a comprehensive overview on the state of the art of double skin façades.
- For a building, which is not highly glazed and with a high level of thermal insulation, the energy use for heating and cooling is likely to be lower, than for a highly glazed building with a DSF. On the other hand single skin fully glazed façades often have a higher energy demand compared to DSF.
- The overall energy performance of naturally and mechanically ventilated DSF can be calculated with accuracy using mean monthly temperature and air velocity data. However for the actual design of façade systems detailed simulation tools are strongly recommended. These simulations have to take into account the climate during an entire year, especially the extremes.
- The certification of double skin façades is possible by using a *reference façade method* (comparison of building energy performance considering double skin and standard façades).