

Press Information

Facade-Lab in Großbeeren near Berlin: Competence Centre for Integral Facade Technology Opened

Berlin, 11 June 2010. Higher, further, faster: increasingly complex major international construction developments under strong pressure to maintain quality and deadlines while reducing costs are steadily raising the demands on building design and construction technology. The building envelope in particular, with its many functions as the representative “face” of a building, as protection against climatic environmental conditions, and as a lighting and ventilation element, creates an area of work which can no longer do without highly qualified specialists. With the foundation of the Facade-Lab research and development centre in Großbeeren near Berlin, opened on 11 June 2010, priedemann fassadenberatung GmbH plans to advance technological progress in this segment and optimise the links between design, planning, construction, and management. With the slogan “Experience Sustainable Technology”, the development and implementation of the latest facade solutions are brought to life.

As internationally successful engineers for facade consulting and planning, the company sees great potential in the combination of specialised engineering knowledge and competencies in electronic data processing. The key topic at the Facade-Lab is “Intelligent Facade Engineering” (IFE), a virtual, integrated procedure for the optimised planning, construction, and management of facade construction according to the method of “Building Information Modelling” (BIM). All applicable information is stored in a digital database and networked to form a virtual, component-oriented 3D facade model. This contains not only the geometry of the individual components but also factual data such as costs, primary energy expenditure and capacity targets. The parametric volume model serves to generate data for construction and work planning, for material procurement process, all the way to control of CNC production machines. In this way, prototypes and 1:1 sample facades (mock-ups), for example, can be created in the service of building quality assurance.

Optimised Planning and Construction Process with “Intelligent Facade Engineering” (IFE)

Compared to traditional building design, where changes must be laboriously carried over to all individual design and into all costing and quantity surveying procedures, parametric building modelling facilitates considerably reduced coordination and input and helps those involved in planning to better share information: changes to the project are automatically updated with the linked parameters and are immediately available to all parties as retrievable drawings such as sectional views and elevations, and as data modules. IFE can be used to efficiently create a wide range of representations of options and process in the

planning and construction process, including the related data on primary energy requirements, amounts, and costs as well as project control processes, such that complex projects can be optimised on a model-driven basis as early as the planning stage. IFE not least overcomes the problem of inefficient coordination between the planning and construction parties caused by data incompatibilities or transmission errors by generating the data for component manufacture machine control from the virtual facade model and enabling the coordination of on-site processes. When Facility Management comes to manage the building, it also provides consistent information on use and management, such as maintenance intervals, upkeeping requirements, and manufacturer data.

Synergy Effects from Linkage of Four Fields of Activity

Surrounding the key topic of IFE, the Facade-Lab groups its four cornerstones for the development and launch of wide-ranging sustainable technologies for the building envelope: the field of “research” provides cutting-edge stimuli and develops innovative facade technologies to the market readiness stage. Functional prototypes and storey-height mock-ups on a 1:1 scale are created by a CNC production machine or by third-party manufacturers in the area of “implementation”. With a multitude of sample facades, the “showroom” offers trade visitors an overview of the latest materials and technologies in facade construction. Finally, the “forum”, as a venue for experts to share research and development results, is the basis for the implementation of the developed processes and technologies on national and international markets and in turn enriches the field of research. All the four areas under the roof of the Facade-Lab are closely linked and mutually enrich one another through a wide range of synergy effects.

Research and Development: the Basis of Technological Innovations

Increasing requirements on the efficiency of the facade as a protective layer against heat or cold — particularly in the light of rapidly growing construction activity in regions with extreme climate conditions and the emerging scarcity of natural resources — demand intensive efforts to develop technologically progressive solutions in the field of energy-efficient and sustainable construction. With its broad-based interdisciplinary research and development activities, the Facade-Lab is dedicated to this goal. The close linkage with real-world planning and construction constantly generates new problems; the solutions developed can in turn be converted directly into practice. Alongside IFE, current research topics include photovoltaic thin-film modules integrated within components, automated facade cleaning systems, prestressed glass supports, glazing with integrated LED conductors, exhaust air facades for reduction of cooling capability and heat output, and control modules for complex facade functions.

Implementation: Planning and Quality Assurance with Mock-Ups and Prototypes

On the basis of the IFE data, the Facade-Lab produces functional prototypes and mock-ups during the planning phase. Architects and investors can “tangibly” experience their facade concept on-site and at a scale of 1:1, enabling them to examine the planning results at an early stage. In contrast to the normal case, where a mock-up is at best developed following

award of contract to the facade fabricator, in Façade-Lab the planning can be considerably optimised without any biased interest. The tender to contract can be worded more precisely and with the unambiguous “model” no longer contains any room for interpretation. The mock-up thus ensures greater planning and quality assurance and can also be used for early marketing of the building — for example by being presented on the future building site to potential buyers or investors. The practical creation of the mock-up is carried out by the CNC multi-axis production machine in the Facade-Lab, which is directly controlled from the IFE model and can therefore image the progress of planning in real time. On the other hand, specific units of functional sets — for example in the fields of photovoltaics, solar-thermal energy, solar cooling, vacuum glass, or “phase changing material” — are built to implement new developments, illustrate solutions, review benefits and efficiency, and control costs.

Showroom: Experience Inspiration and Innovative Technologies at First Hand

In line with the slogan “Experience Sustainable Technology”, the Facade-Lab brings architects, developers, investors, contractors, manufacturers, and technicians together in an inspiring, interdisciplinary showroom and presents a wide range of facade materials and solutions as well as their possible applications. Here, too, the haptic and optical impression is more “real” than with the usual material samples. The materials are presented in a structural context with connections, joints, and corner solutions on storey-height supports with a width of 1.35 m. Further colours and surface qualities can be seen in the accompanying sample catalogue. In future, prototypes from development processes as well as mock-ups of completed projects will also feature in the Facade-Lab showroom.

Forum: Sharing and Enhancing Knowledge on Implementation of Developed Innovations

The Facade-Lab is a specialist venue for project-related or general training, workshops, and talks as well as conferences and expert events held by independent institutions in the area of facade development. Alongside other research fields, advanced training topics include photovoltaics, solar shading, and safety systems, as well as the area of maintenance, repair and operations. The work of the Facade-Lab as a forum for sharing research and development results serves to implement these results on the markets and steadily increase their significance in the planning and construction of ambitious facade structures.

Pictures:

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Opening Facade-Lab_1.jpg; Opening Facade-Lab_2.jpg

Picture caption: Wolfgang Priedemann, Wolfgang Feuerlein and Lars Anders, the three Managing Directors of the newly opened Facade-Lab in Großbeeren near Berlin, with Andreas Rödel, Managing Director of the partner company PROGEO.

Opening Facade-Lab_3.jpg

Picture caption: With the slogan „Experience Sustainable Technology“, the research and development centre brings the latest technologies and planning processes for facades to life.

Opening Facade-Lab_4.jpg

Picture caption: Architects, developers, investors, manufacturers and technicians: Numerous visitors from home and abroad came to the opening of the Facade-Lab in Großbeeren.

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