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glasstec 2008 Theme Service

More Than Just a Facade

glasstec is the leading international trade fair for the global glass industry and provides an indispensable overview of solutions and trends in glass manufacturing, glass machinery production and the glazier trade. In a series of articles, Messe Düsseldorf presents interesting projects realised with glass throughout the city of Düsseldorf, where glasstec will be held from October 21 – 25, 2008. One example is the multi-functional glass façade of the Capricorn House at the Düsseldorf Media Harbour.

Completed in 2006 the Capricorn House features a sophisticated, all-encompassing energy concept. The building owner Capricorn Development GmbH & Co. KG required architects Gatermann + Schossig to construct a building with both primary energy demands 20% below the values set by the current energy-savings ordinance and utterly flexible office design. To meet this demand the Cologne architects opted, amongst other things, for a decentralized, in-facade ventilation system. This concept offers many benefits not only from an energy stand point but also in terms of space gains inside the building. The whole complex is “serviced” by three “facility cores” that take up as little as 10% of the total floor area. Ventilation ducts under the ceilings are unnecessary, widening the scope for room layout design. Another demand made by the owner was to create as much A1 office space with high user comfort as possible. The architects chose a

meandering-type ground plan for the narrow plot and integrated four cross-story, 26 meter high atriums in the space in between. As a result, the number of offices with direct daylight was increased. Furthermore, the spacious atriums protect office users from traffic noise and help control the building climate.

Multi-functional glass facade

An engineering masterpiece at Capricorn House is the so-called i-modulFacade. Composed of 55% transparent and 45% opaque façade modules it ensures the building does not overheat in summer. The aluminium-section facade is multi-functional and contains all the necessary technical facilities to control the room climate individually. The opaque areas are made up of single-shell glass components with an enamel back coating in high-visibility red and serve as a shield for the roughly 20 centimetres thick ventilation modules. These cool, ventilate air and recover heat. Furthermore, lighting, noise absorption and acoustics elements were incorporated into the façade panels. Thermal insulation is ensured by the curtain-wall façade area containing Vacutherm panels. All facade modules are made up of three components each: a 1.80 meter high, red glass panel, a skylight that opens at night to cool the rooms and a floor-to-ceiling, triple-glazed box-type window. On the ground floor the facade units are different because of higher ceilings and consist of uninterrupted opaque modules. They come with built-in high-thermal insulation flaps that open outwards.

On the standard floors floor-to-ceiling casement windows ensure ventilation. This means users can individually control their room climate. Pull-up sheers are integrated in the casement windows as sunshades and protected against weathering by deflection sheets.

Complete pre-assembly

A crucial advantage of this innovative facade system is that it can be completely pre-assembled. According to the architects, this substantially increases the quality, accelerates installation and provides assured planning. All 1,100 facade elements of the Capricorn House were factory-assembled and delivered just in time for mounting.

Geothermal source of energy

Despite their multi-functional qualities the decentralized ventilation modules in the facade do not entirely suffice to heat and/or air-condition the building. The base-load, heating and cooling energy supply for the Capricorn House is provided by two heat pumps in conjunction with a groundwater well used as a geothermal source of energy. Heat pumps recover the energy for heating and cooling the building from the groundwater pumped up by three suction wells. Both heating and cooling is achieved through concrete core activation in the ceilings. In addition to this, the building is connected to a long-distance heat supply and refrigeration system.

Project Information:

Project: Capricorn Haus

Location: Holzstrasse 6, 40219 Düsseldorf, Germany

Owner: capricorn Development GmbH + Co.KG

Construction Period: 2004 to 2006

Architects: Dörte Gatermann & Elmar Schossig, Cologne

Upper Floors: 7

Underground Floors: 4

Gross Floor Area: approx. 26,000 square meters

Total Useful Area: 42,000 square meters

Expected Energy Costs: 0.65 Euro per square meter/month

Awards:

2007 "best architects 2008" label awarded

2006 Innovation Prize for Architecture and Technology, AIT

1st Prize for the Integration of decentralized ventilation elements in i-modulFassade facade

2006 Innovation Prize Architecture and Office

Photos are available at upon request.