Breathing Ceramic Façade

BSU Hamburg
Sauerbruch Hutton Architects

One of the most energy-efficient buildings in Hamburg has been occupied

In July about 1500 employees of the State Ministry for Urban Development and Environment moved into one of Hamburg's most energy-efficient buildings. The new building in Hamburg-Wilhelmsburg that was designed by the Berlin-based Sauerbruch Hutton Architects has achieved the so-called KW70-Standard and has an annual consumption of only 70 kilowatt hours of heating energy per square. The specially energy-efficient Gartner façade with multi-coloured ceramic stones has been playing a key role. It combines the highest insulation standards with a high degree of facade transparency that is characterised by a sophisticated ventilation system. A detailed report about building site and façade has been issued already in the IGS 3-2013.

Ventilation flaps and opening side-hung windows for natural ventilation and overnight ventilation

The new building for the State Ministry for Urban Development and the Environment (BSU) was a key project for the Hamburg International Building Exhibition (IBA) 2013. The construction has now been awarded gold certification from the German Sustainable Building Council (DGNB). The low primary energy requirement played an essential role in the evaluation of the building. In addition to geothermal energy the heat from a cogeneration plant is used. All rooms have been provided with thermoactive ceilings with inserted cables for both heating and cooling. The façade is further characterised by sun shading on the outside. Each façade element includes a ventilation flap and an opening side-hung window for natural and decentralised venitlation. This also allows the utilisation of night cooling for a burglar-proof overnight ventilation.

The side-hung window with triple insulated glass is operated by a window handle the same as the ventilation flap within an aluminium leaf. The ventilation flap with a free cross section of 0.15 m^2 for ventilation has been installed weather-protected behind the external sheet cladding. Protected against wind and rain the supply air can therefore be introduced via openings in the lateral soffit panels. The fittings of the ventilation flaps are concealed so that no other fitting components are visible besides of the window handle. The ventilation flap

itself has a size of 340 x 2,000 mm. Unlike the opening windows the ventilation flaps ensure a draft-free and burglar-proof ventilation of the rooms. Apart from the ventilation the opening windows serve mainly for the cleaning.

26,000 straight, convex or concave ceramic stones

In a single-skin element façade in aluminium with a total area of approximately 20,000 m^2 Gartner has incorporated around 9,000 m^2 ceramic cladding with 20 different NCS-colours. The colours were applied thinly and transparently onto the ceramic stones so that the basic colour of the stones still shines through. The 26,000 ceramic stones have a partly straight, partly convex or partly concave shape. The linear dimensions are very different in the area of the building waves. Different cross sections and colours also had to be combined. This means that around 13,500 different ceramic stones had to be incorporated in the façade via RFID-chips. The ceramic stones were installed without visible fixings by means of a specially developed anchoring system.