Fabrication & Installation

The single-skin and double-skin facade designs developed by KSP Jürgen Engel Architekten placed extreme demands on the fabrication process. The individual unitized curtain wall units, infill panels and electrical components were produced and assembled at our Fritzlar plant.

**Fabrication process and assembly of unitized curtain wall units**

The unitized curtain wall units for the office tower facade were fabricated at our Fritzlar plant. All components, including electric drives and infill panels, were factory-assembled.

GIVEN THE WIDE DIVERSITY OF CURTAIN wall units, each module was individually entered in a database together with its exact position in the facade. This allowed each unit to be treated as a unique component and streamlined the process of allocating accessories to the many different modules, thereby simplifying subsequent installation.

The associated fabrication and installation instructions were also assigned to the individual units recorded in the database. The various database entries and allocations were then used by our engineers to generate the fabrication documents.

The fabrication of all curtain wall units was completed within around ten months. The production facilities in our workshops were operated in line with the specific requirements. The units were fabricated by our skilled team of operatives using a flow production system, with different operations carried out at each station.

**Logistical requirements and on-site installation**

Given the immense volume (some 3,000 m² of curtain wall units), we decided to adopt a just-in-time fabrication system, supplied to the specific site requirements. In most cases, the finished curtain wall units were delivered to the site and installed at the latest three days after production.

This extremely rigorous demands on the logistics and installation processes; the lack of on-site storage capacity severely narrowed the time window for delivery of the components. The outer glazing of the double-skin wall units had to be moved to the site by special trailers. In the units with the logistics concept, deliveries had to be made in the late evening or early morning hours.

The use of special transport racks allowed rapid unload of the components and their immediate transfer to the point of installation. Special logistics teams were responsible for the distribution of all curtain wall units, via staging platforms to the individual storage, where they were then in-stalled.

The following installation procedures were adopted:

**Procedure 1**

- The curtain wall (double-skin facade) units were delivered and moved across the site in crates, then placed on staging platforms for distribution within the building. Prior to installation, the units were first moved to the edge of the structural frame, then they were lifted out of the building using a mini-crane located in the lobby area and hoisted into the prepared anchor brackets.

**Procedure 2**

- At inaccessible locations or in areas of wall surfaces, site crane wells were used to install the units. The components were picked up from the ground-floor level and lifted to the point of installation. Fine alignment and sealing of the units were performed from the interior through access openings in the wall surfaces.

**Procedure 3**

- After delivery, the oversized single-skin facade units were stored temporarily on the large staging platforms. They were later moved to the place of installation by using a monorail system mounted at the edge of the building.

*Photo:* PalaisQuartier GmbH & Co. KG©

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*Photo:* PalaisQuartier GmbH & Co. KG©

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*Photo:* PalaisQuartier GmbH & Co. KG©
The PalaisQuartier complex in Frankfurt/Main boasts an unmistakable identity. Adjoining the shopping mall and reconstructed baroque palaces, the Tham and Tasch Palais, two high-rises designed by internationally distinguished architectural practice Jürgen Engel Architekten dominate the skyline.

**Mission**

The new office tower at Tham-und-Taxis-Platz in the centre of Frankfurt/Main offers an attractive home for global corporations. The architecture, featuring modular elements that include inwardly and outwardly inclined facades, proved a tough test for our engineering team.

**Structural & Facade Design**

Given the stringent technical requirements and aesthetic criteria, as well as the tight tolerances that allowed for no rework, the tests were needed to obtain the required certifications.

**Facade**

From an architectural perspective, the entire PalaisQuartier ensemble makes no attempt to compete with the German financial center Frankfurt Cathedral. While the architectural ensemble nonetheless asserts its own unique identity, it manages to seamlessly integrate with the existing neighboring building clusters.

**Inteors**

A combination of imposing architecture, prominent urban location and wide-ranging amenities make the PalaisQuartier office tower a unique working environment. But work is only one of the attractions hosted at the site: restaurants, staff and customers also have the opportunity to go shopping, chill out or, if needs be, even stay overnight in the neighbouring hotels.

**Facts and figures: the essentials in brief**

- **Glass facade-wall**
  - Project data:
    - Unitized single-skin curtain walls: approx. 14,000 sqm
    - Unitized double-skin curtain walls with fixed lights: approx. 1,200 sqm
    - Unitized single-skin facades with parallel outward-opening windows: approx. 1,400 sqm
    - Curtain facades, mainly in the form of single-skin facades with fixed panes: approx. 2,700 sqm

- **Intelligent energy concept**
  - The PalaisQuartier office tower project was designed in three basic variants: a) corridor facades, mainly in the form of single-skin facades with fixed lights, b) unitized single-skin facades with parallel outward-opening windows, and c) curtain facades, mainly in the form of single-skin facades with fixed pane sizes of up to 2.1 x 3.5 m.

- **Construction**
  - Total curtain wall area: approx. 22,000 sqm
  - Unitized double-skin facades with integrated photovoltaics: approx. 2,700 sqm

- **Design work undertaken by component tests**
  - Material test results confirm the rating for thermal insulation and condensation control.
  - Solar control/insulating glass units: approx. 3,700 sqm
  - Unitized single-skin facade modules: approx. 14,000 sqm
  - Flat steel frames: approx. 6,800 m²
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  - Single-pane LSG units: approx. 1,600 m²
  - Solar control/insulating glass units: approx. 3,700 m²

- **Facade design**
  - The curtain walls intended to meet the stringent technical requirements and aesthetic criteria, as well as the tight tolerances that allowed for no rework, the tests were needed to obtain the required certifications.

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