ARCHITECTURAL CONCRETE TAKEN TO THE NEXT LEVEL

ANCHORING SYSTEMS FOR UHPC

UHPCs are Ultra High Performance Concretes, they have been developed over the past 30 years. Their characteristics and performances have led to new façade typologies. Huge projects such as the Louis Vuitton Foundation in Paris, the MuceM in Marseilles or the Jean Bouin Stadium in Paris have used these new materials as claddings.

Thin panels from 2 up to 6 cm thick, composite cement/glass panels (GRC), concrete matrix solutions or exceptionally large panels can be executed thanks to this new technique, permitting large architectural freedom. The use of UHPC panels in ventilated façade systems limits thermal bridges.
NEW PERSPECTIVES

FIXINOX provides anchoring solutions for these innovative claddings. We use our experience in stone cladding and architectural concrete to design innovative anchors, adapted to the architectural possibilities as well as the inherent challenges of each project. Inserts have been specifically developed and tested in a laboratory for that purpose.

Depending on the project, anchors can be placed at the back, the sides or underneath the panel with angle supports. All our solutions are 3D adjustable for an easy on-site set-up.

A standard is not currently available for this type of anchor. Indeed, amongst our numerous projects all have required different solutions, as can be seen in the following selection of projects.
For this experimental project (1250 m² of façades) the anchoring techniques were strongly inspired by stone anchoring solutions: pins were drilled into the side of the panels and anchors were placed in the vertical joints. Upon request of the contractor, three degrees of adjustment were placed in front of the insulation. The insulation had to be pre-installed by a different team than the one installing the cladding.
The challenge of this project was to anchor the panels on a vertical steel stud frame instead of a concrete loadbearing wall. In order to achieve this, all the anchors on the façade had to be laid out taking into account the relative position of all the beams and the UHPC cladding panels. Eventually, stainless steel inserts serving as anchoring pins were designed and tested by FIXINOX.
There were numerous constraints in this project: the panels were tilted at a 6° angle with regard to the concrete wall, the gap thickness varied and access to the anchors was limited.

Together with the contractor, the installer and the precaster, efficient anchors were designed. In the lower part of the panel, a 3D-adjustable support was placed and an articulated wind restraint was placed in the upper part. All anchors were invisible.
For this restoration, the architects had designed large UHPC elements. The building structure was made of concrete slabs and columns.

The challenge for FIXINOX was to design an anchoring system that was able to connect the panel anchors to the building’s columns, the anchoring points present on the panels were not aligned with the columns.

Substructures attached to the columns were specially designed. 3D hanger anchors were then assembled to these substructures ensuring the connection of the panels to the structure.
Panel weight: 1300 kg
Thickness: 4 cm
Number of panels: 80
Anchor type: Back hanger and channel

CHALLENGE:
TILTED FAÇADES WITH RESPECT TO THE BEARING STRUCTURE AND WATERPROOF MEMBRANE

PROJECT-TYPE 5
RESIDENCE, PARIS, FR

“FIXINOX used its experience of stone and architectural concrete in order to design anchors which could respond to the constraints linked to the project (waterproof membrane, roofing panels, difficult access).

The close collaboration between engineering offices was indispensable for the success of this project.”
PROJECT-TYPE 6 (GRC)
CULTURAL CENTRE,
MERY-SUR-OISE, FR

Maximum weight: 3000 kg
Thickness: 6-7 cm
Number of panels: 100
Anchor type: reinforced angle support

CHALLENGE:
SUBSTANTIAL WEIGHTS, VARYING GAP AND PANEL THICKNESSES

The façades were completed with composite GRC panels. The panels were attached to concrete as well as a steel frame. Upon request of the client, the anchoring techniques remained traditional. Fixinox therefore dimensioned angles and wind anchors. This efficient solution responded to the clients' request.
INSERT DESIGN IS KEY TO THE ANCHORING SOLUTION

INSERTS’ STATE OF THE ART

Inserts play an essential role in attaching these new materials, they are the connection between these concretes and the anchors that attach them to the loadbearing structure.

The mechanical performances of UHPCs are very different to those of regular concretes. The thickness of the façades can vary from 2 to 8 cm depending on the project, then depending on the composition of UHPC with fibres (quality of fibres, percentage...) the concrete matrix and the mechanical characteristics are different. For these UHPCs, most often without reinforcement, it has therefore been necessary to develop new inserts.

Before use by the client, each type of insert is tested in our workshop in order to ensure its reliability. Overmore, for certain uses, additional independent laboratory tests are completed. In certain cases, the use of anchoring channels is necessary to further improve adjustability.
OUR EXPERTISE FOR YOUR PROJECTS

- Client support as early as the layout stage
- Advice on choosing and positioning of pertinent inserts
- Discussion with the client’s engineering office and the control office
- Taking into account difficulties of installation

... AND FIXINOX’S EXTRA ADVANTAGES

- In-house manufacturing in Belgium
- Stainless steel to ensure durability and security
- Reactivity of our engineering office ensured by an engineer following your project
- Accurate estimate of the R-value available upon request
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FIXINOX HAS CONTRIBUTED
TO EXCEPTIONAL SITES

Biodiversity School
BOULOGNE, FR

The Lofts
Dubai, UAE

Foksal Gallery
Warsaw, PL

Police Tower
Charleroi,BE