EDGETECH's Super Spacer® raises a new icon of modern Budapest

Counted today among the proud ranks of other prestigious, free-form geometry projects as spacer system of choice, EDGETECH-Quanex's Super Spacer® now finds itself in the MOL Campus façade design within BudaPart – at the heart of Budapest's new residential and commercial district.


© Koltay Façades

A job for the singular professional expertise of Agnes Koltay, the MOL Campus project saw the world-renowned façade expert back in her native Hungary after a passion for high-rise buildings had driven her, back in 2011, to create a façade consulting firm in Dubai. It all had Koltay Façades specifying the flexible silicone foam spacer for the complex structural glazing façade with its flat, single-curved -as well as convex and concave- curved panes. Thanks to their location along the banks of the Danube, the freely-shaped façades and 'Panta Rhei' architectural concept (trans. 'all within the flow') might be the guiding principle of the entire building. With its publicly-accessible roof garden, at first glance the 120-metre-high tower top in south Budapest forms an outstanding addition to the new MOL headquarters. As the tallest building nationwide, it may well remain so for a long time, given the ban on high-rise buildings in the Hungarian capital - passed in 2018. However, the elegant, upward-swinging façade merging the 5-storey podium that houses restaurants and conference halls alike into a single unit -as well as the 29-storey tower- is the real architectural highlight at MOL Campus.

ARCHITECTURE FOR THE WORKING WORLD OF THE 21ST CENTURY

This design, created by London-based Foster and Partners in collaboration with Finta Studio, reflects the changes of the 21st century working world. Such developments as remote working, amendments to project teams, job sharing and the space requirements of cooperation versus retreat all demand maximum flexibility from modern office buildings - over their entire lifespan. From the atrium to the MOL Campus tower top, the mix of workspaces and garden areas merge to connect both individual floors and people and is intended to create an inspiring and relaxing atmosphere. Not only.

According to the architects, daylight, fresh air and the unique view of Budapest all combine to bring employees into harmony with both nature and their urban surroundings. Also, the inner-city location affords them the opportunity to either walk or bike to work.

LIGHTHOUSE PROJECT FOR CONVENIENCE AND SUSTAINABILITY

Like many corporations, Hungarian's oil and natural gas company MOL is undergoing a sustainability transformation process that's setting it on course for the low-carbon circular economy. With its total area of 86.000 m² and 2.500 workplace capacity, the new corporate headquarters comes as a lighthouse


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project, serving this goal whilst aiming for BREEAM Excellent and LEED Platinum certification. The entire heating and cooling system will be powered by renewable energy sources - including those of photovoltaics and a geothermal system that can boast a total borehole length that extends to 32.800 metres. Rainwater gets collected and is usable for both watering plants and flushing toilets. The aluminium-glass façade is composed of 24.800 m² of element façade and 1.700 m² of post-and-beam façade - prefabricated and assembled by Scheldebouw. A total of circa 14.000 m² of plane insulating glazing was supplied by AGC Interpane Plattling. Around 500 cylindrically-curved (convex and concave) and multi-curved panes -some with extreme curvature- were manufactured at Finiglas in Dülmen.

Colour-neutral Clearvision was used for the 4-sided structural glazing system - partly as toggle glazing, partly with acoustic film, with Stopray Vision 50/50T double silver-coating on the outside. The flat, double-glazed units consisted of laminated safety glass on the outside and 6 mm toughened safety glass or laminated safety glass/TVG on the inside, while the triple-glazed units consisted of 10 mm toughened safety glass on the outside, 6 mm toughened safety glass with screen printing at position 2 and laminated safety glass/TVG with thermal insulation coating on the inside. The curved insulating glass units are made with VSG on both sides. 16 mm and 18 mm Super Spacer® SG were used as warm-edge spacers. To ensure a distortion-free view, Koltay Façades specified annealed, laminated glass where possible. Due to the extensive glazing, daylight can be used in 90 percent of the rooms. Modern building automation, individual shading options and chilled ceilings all prevent overheating and ensure comfort. Within the tower, the U_{cw}-value of the curtain wall is at 1.4 W/m²K while the U_g-value for the glazing, at 1.0 W/m²K maximum, meets local requirements for passive houses even if only triple-glazing was used for skylight glazing.

3D-MODELLING: MAKING FREE-FORM GEOMETRY POSSIBLE

A constant, digital flow of information between design, engineering, planning and production teams guaranteed that the iconic shape of the building could be implemented as efficiently and cost-effectively as possible. Despite double-curved insulating glass units playing a key role in the building's elegant appearance, it was decided they would be used as sparingly as possible. As Agnes Koltay explains: "The transition between the podium and MOL Campus tower only runs over two floors. Here's why, to ensure fluidity, double-curved glass was considered in this area instead of approach-

ing the curvature by facet-ing the panes. Besides, the two podium floors and tower floors have very different footprints, which also lead to curved shapes. To ease build-ability, we optimised the bending radii and modules arrangement, among oth-er modulation improve-ments, and fine-tuned the geometry." With BIM be-ing now standard for large projects of this type, Kol-tay Façades relies upon parametric design for free-form façades in order to optimise the geometry as well as the individual modules while being able to update the plans auto-matically. In addition to the different plane, curved and double-curved wind loads, structural, acoustic and safety requirements had to be included and simulated as well. On one side of the building, the nearby rail lines and train station jointly increase the level of external noise.

As Koltay adds, "For 3D-modelling and digi-tal tools, Koltay Façades Engineering uses Rhino scripts developed in-house for finite element analysis of aluminium and glass structures. Our responsibility is to trans-form the surface-only model into an accurately-dimensioned 3D model that includes all details, including fastening zones and joint gaps."

SUPER SPACER® - CURVED INSULATING GLASS UNIT SPECIFICATION

As a spacer, Koltay Fa-çades specified Super Spacer® - an already prov-en system. 'The Opus' by Zaha Hadid and the spectacular Killa-designed 'Museum of the Future' in Dubai are just two of the most prestigious free-form façades designed by Koltay Façades that are realised with Super Spacer®. "The decision was driven by the curved insulating glasses, which are almost impossible to realise with rigid spacers. In addition, small toler-ance deviations can occur at the edges of the curved glasses during the manu-facturing process. The structural foam compen-sates for this with its abil-ity to deform and adapt to the space between the panes," concludes Koltay. Joachim Stoss, Manag-ing Director of Edgetech Europe GmbH and Vice President International Sales at Quanex, adds: "In recent years, free-form, organic façades have been among the most impor-tant architectural trends. Without a continuous 3D model chain from design to production -but also without flexible com-ponents like the Super Spacer- they would only be very complex, slow and expensive to implement - if at all. Of course, we're delighted to be on board again for this prestigious European project."

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