

Project name: Kinder Building—Museum of Fine Arts Houston

Location: Houston, Texas, U.S.A.

Architects: Steven Holl Architects | www.stevenholl.com

Façade contractor: Josef Gartner (Permasteelisa North America)

Glass fabricator: ShenZhen ShenNanYi Glass Product Co., Ltd | www.shennanyi.com

Façade engineer: Knippers Helbig Advanced Engineering

Architectural interlayers: Eastman

Featured product: Vanceva® Arctic Snow PVB

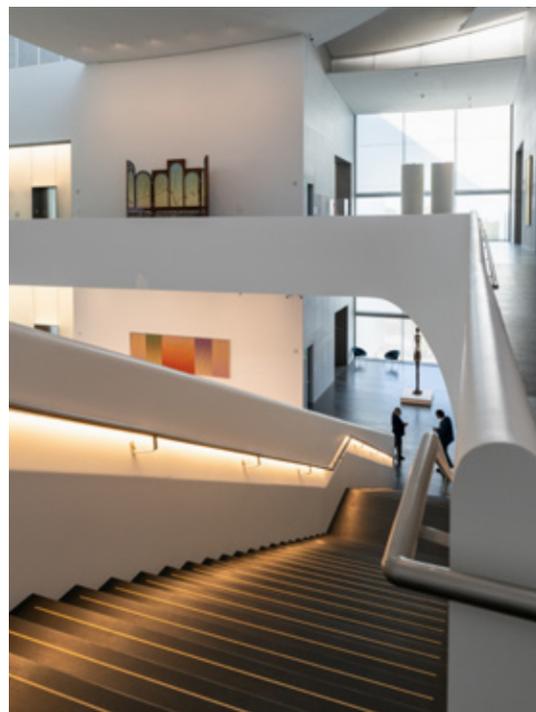
Other firms involved: McCarthy, Kendall Heaton, Transsolar

Façade completion: Fall 2020

Photography: © Olaf Schmidt

Knippers Helbig
Advanced Engineering

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Natural light offers new perspective on fine art.

Kinder Building—Museum of Fine Arts, Houston, Texas

The new addition to the Museum of Fine Arts, Houston (MFAH) boasts an unusual treasure—natural light. Daylight is dynamic and can change the brightness and color of art, making artificial lighting a frequent choice of museums. This is why cultural arts buildings tend to be devoid of glass walls and windows. But Stephen Holl Architects, who designed the new addition, had a distinctly different idea. Using an ingenious system of laminated, translucent glass tubes on the outside walls of the buildings, they found a way to control the light coming in while protecting the priceless classical art inside. Punched openings in the weather wall are opaque and offer a different experience of light behind the glass tubes. Daylight also flows in from clerestory glazing, making the experience of visiting a naturally lit museum completely unique. At night, the glass tubes glow with a soft artificial light, creating a luminous streetscape.

The museum was extended by new two building complexes, now called the Nancy and Rich Kinder Building. With the placement of the museum in the heart of Houston's Museum District surrounded by iconic buildings—including Mies van der Rohe's existing museum building—the design had to be a showpiece.

Working collaboratively with Holl Architects and façade specialists Josef Gartner, German glass façade experts Knippers Helbig began work on creating the glass tubes. The design called for a "cool jacket façade"—a ventilated façade structure consisting of approximately 1,150 translucent glass tubes with a length of up to 6.5 m. Almost the entire building is wrapped with translucent glass tubes located in front of opaque walls and large punched windows. A steel substructure with an invisible structural glazing connection supports the tubes.

The glass tubes have an acid-etched surface on the outside with four translucent Vanceva® Arctic Snow PVB interlayers, which precisely control the amount of daylight passing through them. The success of this project relied heavily on the meticulous selection of materials and forms as well as countless, thorough daylight simulations and mock-ups. During the construction documents phase, a full-scale mock-up was built to measure daylight transmission. Over several months, temperatures were measured on the tubes with the results used in detailed thermal and structural analysis.

The tight bending radius of the glass tubes meant that they could only be produced with gravitational bending. A series of tests were performed to ensure the load-bearing capacity of the glass. In addition to the architectural and daylight-control functions, the Vanceva PVB interlayers in the glass tubes also significantly contribute to the reduction of the energy transmission and the associated cooling loads.

"With translucent interlayers, the desired light transmission can be precisely fine-tuned to what was essential on this museum project," according to Roman Schieber, associate director at Knippers Helbig, who led the glass façade portion project. "Unlike clear glass, translucent glass is visible and results in a totally different and fascinating perception of the space."