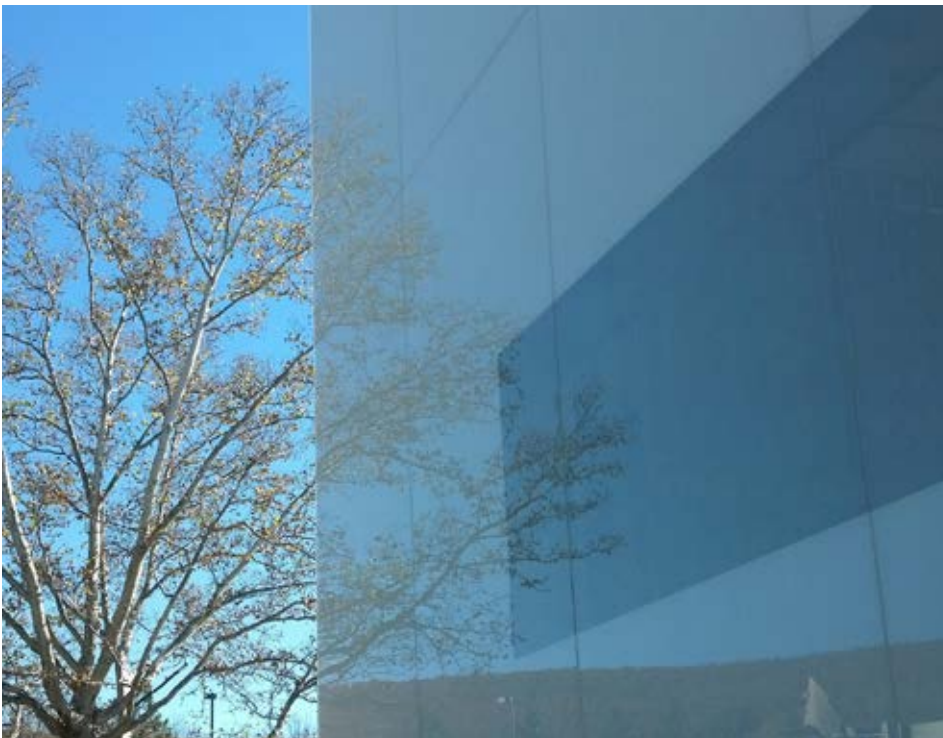




Dow performance silicones

Silicone secures large glass panes at award winning glass museum

CASE STUDY: THE CORNING MUSEUM OF GLASS



The project

Founded in 1951 by Corning Glass Works Company as a gift to the nation, The Corning Museum of Glass is a non-profit organisation dedicated to, and celebrating, one single material: glass. Located in the heart of the Finger Lakes Wine Country of New York State, the museum campus showcases over 35 centuries of glass artistry from all over the world. In addition to its esteemed library research facilities, it has demonstration and teaching studios that create the ultimate experience in glass making.

In 2007, the American public voted The Corning Museum of Glass as number 136 on a list of America's 150 favourite buildings. The museum campus contains a unique collection of modern glass architecture which was influenced by three distinct generations of architects; all of whom had the goal to create a fluid environment, whilst also incorporating glass as a structural material whenever possible.

The original L-shaped design chosen for the 1951 opening had clear lines and clear functionality; the building represented a link to the modernist style of the time. Through time however, a shift was made to more organic, aesthetic style. An additional building to house all the glass collections was composed in 1976 – this had a circular, spiraling exterior composed entirely of rolled glass.

City and country

New York, USA

Product*

- DOWSIL™ 993 Structural Glazing Sealant

Key participants

- **Building owner**
Corning Glass Inc.
- **Architect**
Thomas Phifer and Partners
- **Glass manufacturer**
Thiele Glas Wermsdorf
- **Structural glazing applicator**
HVF Hufen
- **Quality Bond™ technical distributor**
Siebeck-Bitter

*Prior to February 2018, products listed were branded as Dow Corning.





Additions made to the museum in 2001 showcased even further the unique properties of glass as a material for architecture. For example, monumental glass plates installed in the Admissions lobby allowed light to pour in and reflect off specially angled glass panes to maximise natural light. The architects Smith-Miller and Hawkinson received a New York State Merit award by the American Institute of Architects for this design. In addition to this, the new building that housed the Rakow research library included similarly innovative use of glass as a building material by including features such as intricate glass stairs and bridges.

As of March 2015, the Museum opened its doors to a large-scale, cutting edge expansion project, created to accommodate increasing visitation and to create space to display new exhibits. A new wing measures 100,000 square feet and features filtered natural light, created by a sophisticated light-filtering system. In addition to this, the newly renovated contemporary art and design gallery building will be the largest space for displaying contemporary glass art in the world.

High performance DOWSIL™ 993 Structural Glazing Sealant has been specified for securing the expansive insulating glass units on the minimalist glass-box like building façade to the curtain wall structure.

The challenge

The stunning façade of this \$64 million project comprises around 2000 square meters of white colored laminated safety glass, featuring large units of up to 7.5 x 3.2 meters. Despite being designed as a rainscreen façade and incorporating a mechanical hook-in system, an unusual feature requires each glass unit to rest on top of the unit below which then becomes load-bearing. To check for stability and safety in the event that the lower unit becomes damaged and causes glass to fall from the building, a special test program was initiated which included the installation of structural silicone for additional support.

The solution

Dow worked in close co-operation with the curtain walling contractor MBM Möckmühl in the development of a mock up test rig. This test rig was created to simulate the effect of bonding with DOWSIL™ 993 Structural Glazing Sealant between the aluminium solid bars of the sub frame and the glass units. During this test, the structural silicone bite was designed to take over both the wind and dynamic case loads. Furthermore, it also became a back-up system in the event of glass damage by also supporting the dead load. In summary, this test ascertained the potential for shearing of the structural silicone in the event a lower unit suffers damage and relinquishes its support.

To replicate such a scenario the upper unit was installed on the test rig. When abruptly applying the glass weight to the silicone bite, the silicone must be shown to withstand the full load of the glass unit for a specified time. As the interlayer of the laminated glass provides some rigidity for a damaged glass pane, it was considered that the failure would not cause an immediate fall, so the test was observed for 5 days, after which time the unit remained in position thanks to the strength and integrity of the structural silicone. The test was deemed to be a success. With building aesthetics at the forefront of the design for the new Wing, another key element for specification of DOWSIL™ brand silicone was the timely production of a special color silicone in light grey, to complement the glass façade. HVF Silicone Specialists applied custom color DOWSIL™ 993 Structural Glazing Sealant to retain the units on all four sides.

DOWSIL™ 993 Structural Glazing Sealant

Certified by European Technical Approval ETA 001/0005, DOWSIL™ 993 Structural Glazing Sealant exhibits excellent weathering properties and high resistance to ultra-violet radiation, heat and humidity once cured. It is ideal for structural bonding of glass and metal including coated, metal, enameled and reflective glass.

“Collaboration on projects is essential and we rely on partners such as Dow for technical support, particularly when faced with specific challenges such as those encountered for the Corning Museum of Glass. In this case, not only did we need to validate the properties of the silicone, but we also urgently needed samples of the silicone custom color to ensure an exact match with the laminated glass during production of the test rig. Dow provided exceptional support throughout.”

Michael Boettinger, Project Leader
of MBM Möckmühl

For more information

Learn more about Dow's full range of High Performance Building solutions by visiting us online at dow.com/construction.


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