Dow Performance Silicones

Silicone Sealants are at the Heart of Impact-resistant Glazing on New Westin Diplomat Hotel

DOWSIL™

Case Study: Westin Diplomat Hotel



City and Country
Hollywood, Florida, USA

Products*
- DOWSIL™ 995 Silicone Structural Sealant
- DOWSIL™ 795 Silicone Building Sealant
- DOWSIL™ 790 Silicone Building Sealant

Key Participants
- Dow (Midland, Michigan)
- Nichols, Brosch, Sandoval (Coral Gables, Florida)
- IBA Consultants (Miami, Florida)
- Architectural Skylight Co. (Waterboro, Maine)
- RC Aluminum Industries (Miami, Florida)
- DeSimone Consulting Engineers (Coral Gables, Florida)
- Calvin, Giordano & Assoc. (Ft. Lauderdale, Florida)

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

Impact-resistant glazing in rooms and suites at the new Westin Diplomat was constructed with DOWSIL™ 995 Silicone Structural Sealant, while the flowing 6-story glass canopy used DOWSIL™ 795 Silicone Building Sealant. Perimeter joints were sealed with DOWSIL™ 790 Silicone Building Sealant, an ultra-low modulus, high-elongation material.

Extensive use of glass and a unique glazed canopy presented some unique sealing challenges for the Westin Diplomat Hotel in Hollywood, Florida. The building required sealants to deliver critical weatherproofing in this hurricane-prone region, while also providing structural integrity for nearly 250,000 square feet of impact-resistant glazing. The 1000-room facility was completed under the South Florida Building Code, which contains the toughest wind- and impact-resistance standards in the nation. The hotel, lobby and parking structures total more than 2.8 million square feet, enclosed by nearly 1/4 million square feet of impact-resistant glazing.

High-performance silicone sealants are playing a key dual role at the elegant Westin Diplomat Hotel and Spa in Hollywood, Florida, providing critical weatherproofing in this hurricane-prone region.

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The silicone sealants also deliver structural integrity for nearly 250,000 square feet of impact-resistant glazing in the new $800 million, 39-story complex. The 1000-room facility by architects Nichols, Brosch, Sandoval and Associates was completed under the South Florida Building Code, which contains the toughest wind- and impact-resistance standards in the nation.

"We had to meet the standards for hurricane resistant construction in all windows, doors, glazing, patio doors and louvers," said NBS architect Jim Wurst.

"The new code also applies to the 6-story glass wave skylight over the main lobby, which shelters all the way from the pool deck to the main entry."

In addition to the windows and sliding doors in all rooms and suites, the silicone sealants were used for all glazing in over 200,000 square feet of meeting and convention space, which is offset by a five-story atrium featuring some of South Florida's most stunning use of glass. The convention center hosts a 50,000-square-foot unobstructed Great Hall and four ballrooms, with the largest showcasing an ocean view window that is 20 feet high and 150 feet across. Beyond the lobby is the infinity-edge pool with its trademark see-through bottom (also sealed with silicone) and waterfalls spilling into the 240-foot lagoon-style pool below.

Project Details

The glazing consultant on the Diplomat project was IBA Consultants. IBA provided pre-construction design consulting, including approval of the impact-resistant systems using DOWSIL™ 995 Silicone Structural Sealant for the capture window systems in rooms and suites. "The sweeping wave of curved glass that flows over 300 feet from the east side of the building to the west presented some unique considerations, sheltering the main lobby and carports at both ends of the structure," said IBA president Mark Baker.

"The complex geometry and intricate details of the design presented some challenges," Baker observed. "The aesthetics were obviously very important, but every window system throughout the building had to meet the extremely rigid standards for design pressure and impact resistance set out in the South Florida Building Code, the nation's first code requiring hurricane resistance for building envelope systems," he said.



"This code set the standard for impact-resistant design now incorporated into the new Florida Building Code and International Building Codes."
On the Diplomat project, large-missile impact requirements apply to all areas 30 feet above ground or less, and to meet those standards, a 5/8" laminate system with two heat-strengthened lites and a 3-layer inner film were selected. Small-missile impact standards are used for windows above 30 feet, where the window designers chose 9/16" laminated construction, with a 2-layer film. DOWSIL™ 790 Silicone Building Sealant was used for all perimeter joints.

"Each pane of glass is part of an impact-resistant laminated system," explained structural engineer Leon Murray of Architectural Skylight Co., supplier of the sloped and vertical glazed walls in the lobby areas of the hotel buildings. "We used [DOWSIL™] 795 Silicone Building Sealant because it's a formulation with a long and successful service history, which can be used for both structural and weather sealing applications. It offers excellent adhesion, tensile strength and movement capability, which are all important properties in withstanding wind cycle loads and missile impacts."

In manufacturing the factory-glazed window systems, ASC used DOWSIL™ 795 Silicone Building Sealant for the weather seal, structural sealant, heel bead and cap seal. Murray estimated that the lobby area glass alone involved more than 42,000 lineal feet of sealant.

"The combination of structural strength and flexibility in the sealant is a key to meeting the impact-resistant glazing standards," added IBA's Baker. "While several other material types could deliver the strength to withstand the test's initial impact requirement, I'm not aware of any sealant other than silicone that also provides the flexibility to hold up under the 9000-cycle wind load testing that follows." Jobsite inspections and water penetration resistance testing performed by IBA confirmed the superior adhesion and performance of the silicone sealants in the severe coastal environment.



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30023848 Form No. 62-1185-01 B