

## INDUSTRIAL Market Trends®

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### **Sealants Halt Hurricanes' Destructiveness**

By Katrina C. Arabe

Extremely strong silicone sealants are protecting a new luxury hotel in hurricane-prone Florida. Find out how they help the building resist high impact winds and water penetration:

To withstand the swirling winds and destructive impact of hurricanes, a new luxury hotel in Florida is relying on high-performance silicone sealants. Providing both weatherproofing and structural integrity, the sealants are used in nearly 250,000 square feet of glazing in the elegant Westin Diplomat Hotel and Spa—a 39-story, 1,000-room structure in Hollywood, FL. In fact, the opulent, \$800 million complex by architects Nichols, Brosch, Sandoval and Associates meets the country's most stringent wind- and impact-resistance standards, which are found in the South Florida Building Code.

"We had to meet standards for hurricane-resistant construction in all windows, doors, glazing, patio doors and louvers," says NBS architect Jim Wurst. "The code also applies to the six-story glass wave skylight over the main lobby, which shelters all the way from the pool deck to the main entry."

Aside from strengthening the windows and sliding doors in all the hotel's rooms and suites, the silicone sealants also reinforce all the glazing in over 200,000 square feet of meeting and convention space. The convention center includes a 50,000-square-foot Great Hall and four ballrooms, with the biggest one featuring an ocean view through a 20-foot high by 150-foot wide window. And continuing the Diplomat's opulent theme is a 240-foot lagoon-style swimming pool, which is beyond the lobby and parallel to the beach. Appearing to float above it is an infinity-edge pool with a glass bottom (also sealed with silicone).

The hotel's beautiful-but-tough exterior confronted IBA Consultants—the company overseeing the glazing—with several difficulties. In particular, the hotel's showy use of glass made the process of sealing trickier. "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," says IBA President Mark Baker.

"The complex geometry and intricate details of the design presented some challenges," he adds. "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. This code set the standard for impact-resistant design now incorporated into the new Florida Building Code and International

Building Codes."

To satisfy such strict standards, IBA approved the use of impact-resistant systems containing [Dow Corning](#) 995 Silicone Structural Adhesive for the windows in rooms and suites. This adhesive/sealant is specifically designed for structural glazing, displaying superior adhesion to most building substrates, such as glass, aluminum, granite and painted surfaces. Upon curing, the material becomes a very tough elastomer that creates a weather-tight bond, which can be guaranteed for two decades.

Meanwhile, another Dow Corning sealant was the choice of Architectural Skylight Co. (ASC), which supplied the sloped and vertical glazed walls in the hotel's lobby areas. "We used Dow Corning 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," says ASC structural engineer, Leon Murray. "It offers excellent adhesion, tensile strength and movement capability, which are all important properties in withstanding wind cycle loads and missile impacts." The lobby area glass used over 42,000 linear feet of sealant, estimates Murray.

ASC manufactured the factory-glazed window systems using the 795 Silicone Building Sealant for the weather seal, structural sealant, heel bead and cap seal. "The weather and cap seals prevent air and water intrusion," says Murray. "The structural seal at the horizontal glass joints holds the glass to the aluminum frame when wind suction conditions occur. The heel beads and structural seals both serve to hold the glass in place and withstand additional wind loading after an impact."

Aside from being structurally strong, the sealant is flexible as well, and this combination of properties enabled it to satisfy stringent impact-resistance standards. Says Baker from IBA, "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 9,000-cycle wind load testing that follows." To verify the sealant's exceptional adhesion and performance, IBA performed inspections and water penetration resistance testing on the window systems.

Both silicone formulations—995 and 795—are practically impervious to UV exposure, rain, snow, ozone, or severe temperatures, making them ideal for the harsh coastal environment. Additionally, window designers chose a third sealant—Dow Corning 790 Silicone Building Sealant—for all perimeter joints. This material cures to a durable, fire-resistant building joint seal. Because it's flexible and possesses strong adhesion and recovery capabilities, it's ideal for building joints that undergo a lot of movement. Moreover, this extreme movement capability enables damaged sealants to be fixed without joint widening, saving time and labor costs.

In summary, with the help of silicone sealants that deliver both weatherproofing and structural integrity, the Westin Diplomat Hotel and Spa combines hardiness with stunning beauty. And because of the flexibility and durability of such materials, this beach resort can withstand the hurricanes that wreak havoc on the region.

Source: Case Study: Silicone Sealants Provide Weatherproofing, Impact Resistance at New Hotel

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