



*An Art Deco masterpiece, the Empire State Building has stood as an iconic fixture in the New York skyline since 1931. Constructed in the shadow of the Great Depression against all odds, the Empire State Building rose to become the tallest skyscraper in the world symbolizing hope, recovery, and a more promising economic future. In the more than 79 years since its grand opening, skyscrapers across the globe have exceeded the Empire State Building's height and outshined its design but none have come close to replacing its grandeur or its historic value.*

## Legendary Empire State Building Undergoes Massive Restoration

*GE SCS9000 SilPruf\* NB Plays Essential Role in Weathersealing and Protecting the Beauty of the Historic Landmark*

### THE CHALLENGE:

#### Weatherseal Without Compromising Limestone Exterior

In 2006, the Empire State Building started to really show signs of age. A \$550 million restoration project was planned to return the building to its glory, with the added challenge of transforming this landmark skyscraper into a model of energy efficiency.<sup>1</sup>

Among many of the planned upgrades was resealing the exterior of the building. Investigative chamber testing of the existing double-hung windows, limestone panels, aluminum spandrel panels and stainless steel vertical chevron mullions confirmed that the urethane sealants applied to the building more than ten years earlier were chronically failing.

At the time of installation, urethane sealants were commonly utilized on natural stone substrates as many available silicone sealants at the time characteristically tended to bleed into porous masonry substrates causing significant discoloration of the exposed surfaces. Urethane, however, has a shorter average life expectancy than silicone because it is more susceptible to UV degradation.

#### Eliminate Tenant Complaints and Increase Energy Efficiency

More than a decade of heavy New York rains, strong winds, excessive UV exposure, and extreme temperatures compromised the urethane sealant leaving the building susceptible to air and water penetration, particularly at the transition joints between the stainless steel vertical mullions and the adjacent limestone panels as well as at the typical mullion splice joint and lap joint locations. There was building damage throughout the inner and outer façade, which increasingly drew complaints from tenants disturbed by bubbling dry wall, water stains, and energy-draining drafts.

#### Satisfy New York Landmark's Commission Specifications—Requires Function and Aesthetics

As a historic landmark, the Empire State Building's restoration work and the products used to accomplish it needed to first meet specifications monitored by The New York Landmark's Commission. The Commission was focused on, among other things, maintaining the integrity of the building's aesthetic beauty so it was critical that any sealant applied to the building not stain its trademark limestone façade.

#### Meet Aggressive Deadline

Further complicating the job was the need for the new silicone sealant to effectively adhere to the foam backing, a secondary perimeter weatherseal comprised of an expanding foam sealant. And, considering the structure's impressive height of 102 stories tall (the average skyscraper in New York is 35-40 stories tall), the project would require an enormous amount of silicone sealant delivered against a very aggressive one-year timeline.

Location:	New York, N.Y. (U.S.)
Challenge:	Remove and clean out existing polyurethane and seal water and air leaks present between aluminum window frame and precast without staining the building's Indiana limestone panels. Work against an aggressive one-year timeline, ensuring on-time delivery of product and providing on-call technical expertise as needed.
Structure:	102-story, Art Deco masterpiece with more than 6,500 windows
Product:	GE SCS9000 SilPruf* NB



John Rudisill, a vice president with Consultant Associates of New York, was charged with managing the success of the project. Having worked with GE sealants and its team of experts since 1999 on other projects, Rudisill immediately brought the team into the fold challenging them to help deliver a solution that met all of the project's specifications.

#### THE SOLUTION:

### Exceptional Service, Technical Support & High-Performance Products: A Winning Combination

"We ultimately selected GE sealants for the Empire State Building because, from conception to completion, the team of sealants experts provided us with everything we needed and more," said John Rudisill, Consultant Associates of New York. "From orchestrating preconstruction mock-up and performance testing that ensured agency approvals, to timely deliveries of the product and ongoing on-site quality assurance testing, the team of sealants experts and silicone products proved essential to the overall success of this project."

### GE SCS9000 Seals Out Air and Water Without Compromising Aesthetics

From beginning to end, the technical experts supporting GE sealants worked directly with Consultant Associates to help ensure proper product specifications, timely delivery and proper installation procedures for GE SCS9000 SilPruf\* NB, a premium one-component, medium-modulus, neutral cure silicone sealant that does not sacrifice silicone durability for aesthetic appeal. It is specially formulated to reduce, and often eliminate, dirt pick-up, surface streaking and, most importantly in the case of the Empire State Building, staining on many substrates including limestone.

"During preconstruction mock-ups and performance tests, the team of sealants experts helped to secure a critical approval from the New York Landmark's Commission by demonstrating SCS9000's unique ability to effectively weatherseal without staining the surrounding limestone," said Rudisill. "This guarantee, coupled with the confidence it instilled in the team of experts working on the solution, assured the project moved forward in a timely manner."

### A Responsive Team of Experts and Timely Deliveries Keep Restoration On Schedule

In challenging wind conditions in a busy metropolitan area, 25 to 30 rigs worked on the building around the clock each day to complete the remediation project in just one year's time. Access to the sealants technical experts and timely deliveries of product proved critical to the operation. One late or missed delivery of sealant meant idle crews, thousands of

dollars lost, and delayed production schedules all unacceptable, but especially untenable, in challenging economic times.

"More than 530,000 linear feet—approximately 10 miles of SCS9000—was used to weatherseal the Empire State Building. We relied on the team of experts for GE sealants to have it available and deliver it when we needed it," said Rudisill. "They never missed a delivery. We had all the SCS9000 that we needed, when we needed it, so the job went off without a hitch."

Distinguished from competitors, GE sealants' success on the Empire State Building is a testament to high-performing products, efficient supply chain management, an on-call, responsive and knowledgeable technical team, and a commitment to quality assurance.

#### THE RESULT:

### Empire State Building's New Exterior Enhances Overall Energy Saving Investments

The remediation of the sealant on the Empire State Building's exterior, completed in July 2009, fixed the air and water issues, and the associated tenant complaints subsided. Today, efforts continue to restore the Empire State Building to its former glory while transforming this legendary landmark into a model of energy efficiency. Estimates indicate that once all retrofits to the building's ventilation system, windows, and chiller plant, among several other things are complete, energy consumption at the Empire State Building will be reduced by 38 percent, carbon dioxide emissions by 105,000 metric tons over a 15-year span, and yield a projected annual savings of \$4.4 million.<sup>2</sup>

Contributing to the savings generated by these other upgrades is the highly-effective, long-lasting seal provided by GE SCS9000, now in place on the building's exterior. Unlike the previous urethane caulk, SCS9000 provides outstanding weather resistance, adhesive durability, and lasting flexibility. With these properties, SCS9000 provides long-term sustainability and reduces ongoing maintenance and energy costs by protecting against air and water leaks.

### Success of Empire State Building Proof that Energy-Conscious Preservation is Not Only Plausible...It is Possible

As one of the first successful examples of how developers can help the environment and preserve a historic commercial building while also delivering a return on investment, the Empire State Building again stands as an icon of progress promising a more sustainable tomorrow. As retrofitting methods to existing buildings continue to advance and grow in popularity, the team for GE sealants stands ready to respond with outstanding products and service.

**Pioneered by GE. Refined by GE.** With a history of dedication to innovation and excellence, today's family of GE sealant products address a wide variety of the ever-inventive, increasingly demanding architecture found around the world. Outstanding durability, flexibility, and movement capability are fundamental to the high performance of GE sealants. With decades of experience, in new and remedial applications, on some of the world's most innovative structures, the sealants team provides knowledge and comprehensive support to help ensure a project is successful.

Visit [www.ge.com/silicones](http://www.ge.com/silicones).

<sup>1</sup> "The Height of Sustainability," Preservation Magazine, March/April 2010, page 21.

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