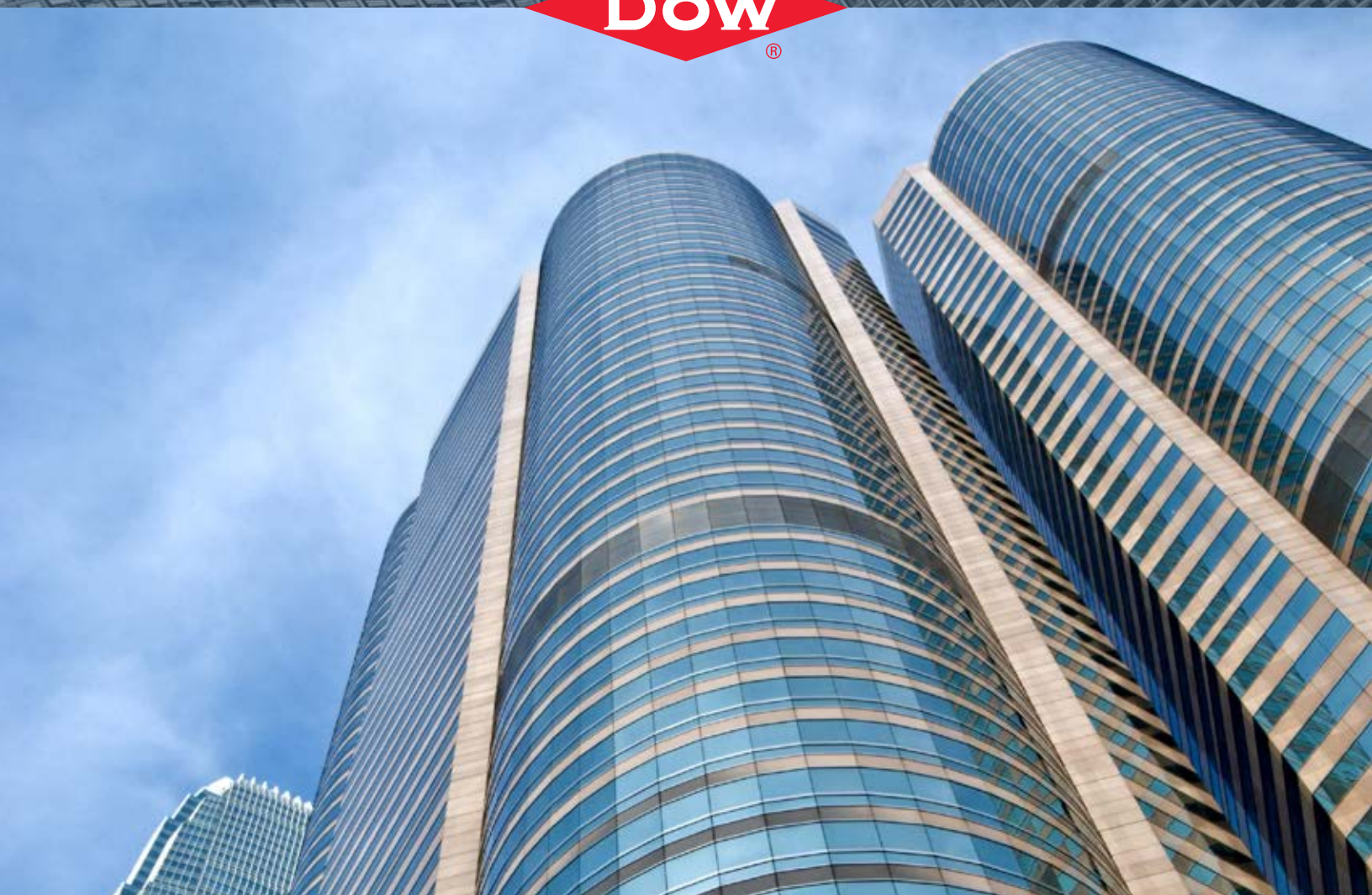
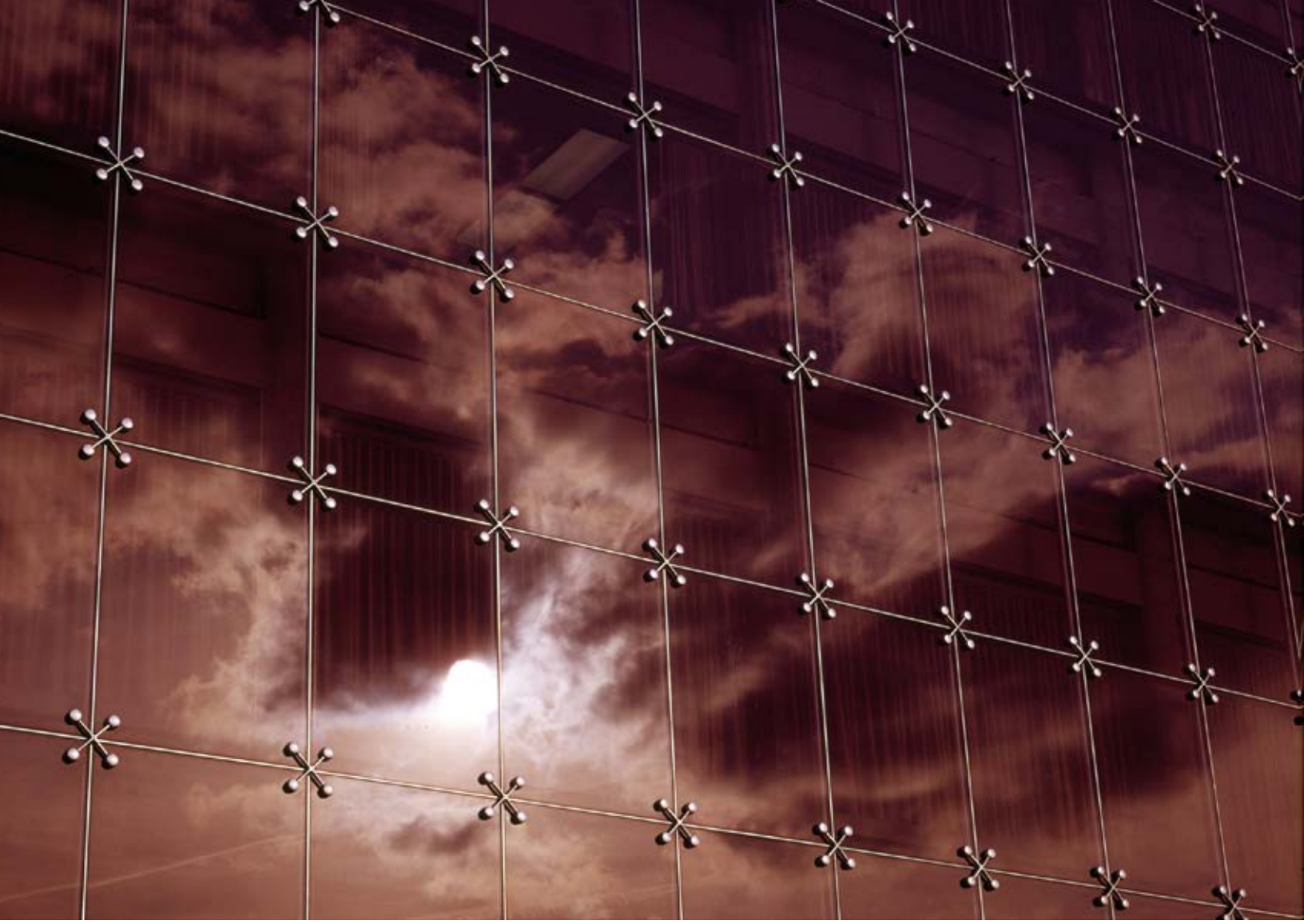
HIGH PERFORMANCE BUILDING SOLUTIONS

Lasting innovation

50 years of structural silicone glazing success

DOW®





Structural silicone glazing from Dow

Changing the face of the world's cities

In the 1960s, Dow pioneered a construction technology that has changed the face of the world's cities – structural silicone glazing. No longer limited by the need for intrusive mechanical fasteners, architectural imaginations soared.

Today, reflections of sun and clouds glide across uninterrupted facades of mirrored glass, metal and stone...thanks to the innovative spirit and technological mastery of Dow.

Designed to transmit windloads from the glass to the building's framework, structural silicone glazing systems must flex, extend and compress in rhythm with the daily stress of differential thermal shear. They must maintain their adhesive and cohesive strength in the face of earthquakes, hurricane-force winds, the sun's ultraviolet rays, temperature extremes, moisture and acid rain.

Unleashing the potential

In the early 1960s and '70s, structural silicone glazing was a new and unproven concept. The possibilities were tantalizing. But who would risk the success of a multi-million-dollar building project on an untried structural sealant?

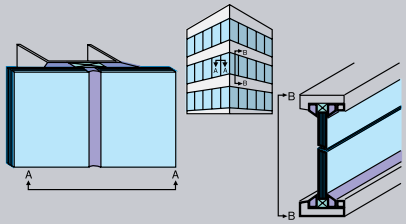
Dow had already earned the industry's respect through the proven performance of its weatherproofing sealants and the expertise of its technical people. Innovative architects, glass and curtainwall manufacturers and contractors accepted the structural glazing challenge, confident that Dow would work beside them to ensure their projects' success.

The Dow structural glazing team tested, retested and tested again... in the lab, in full-size mockups and on the job site. They evaluated their sealants' compatibility with all possible substrates. They tested for adhesion, movement capability, fatigue and failure. They analyzed joint designs, stresses and environmental variables, and monitored every design and installation detail.

About structural silicone glazing

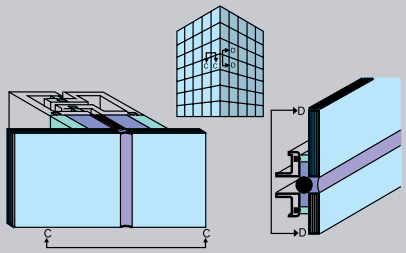
In structural silicone glazing, structural silicone adhesive, rather than metal fasteners, is used to attach glass, ceramic, metal, stone or composite panels to a building's frame. This creates a continuous flexible rubber anchor that absorbs stress and prevents air- and water-intrusion. Only silicone sealants possess the unique combination of strength, flexibility and weather resistance required for structural glazing applications.

The system may be two-sided or four-sided, depending on design requirements. In two-sided systems, only the vertical joints are structurally glazed with silicone, creating a ribbon effect. The dead load of the panel weight is supported mechanically.



Two-sided structural silicone glazing

In four-sided systems, both the vertical and the horizontal joints are structurally glazed with silicone, enabling the creation of an uninterrupted wall of glass. Dead loads are either supported mechanically by a horizontal fin or by the silicone sealant itself, depending upon the design.



Four-sided structural silicone glazing

"It was an exciting time. There was such a spirit of camaraderie in the industry. All of us working together in a community of trust to develop a new architectural concept and prove to the world that it would work."

Jerry Klosowski
Dow

Pushing the envelope

Every conquest opened the door to a new structural glazing application. If the application was within the material's capabilities, Dow helped the industry attempt it and succeed.

They worked with their customers to master windload, dead load and then shared load. Two-sided structural glazing served as a springboard for four-sided glazing, and then for the structural glazing of insulating glass panels.

No longer satisfied with square shapes and two dimensions, architects asked for and received the technical support they needed to structurally glaze triangles and other unexpected shapes and to create three-dimensional curtainwalls.

Curtainwall manufacturers asked for greater control over construction variables and faster production times. They received both through the introduction of a two-part, fast-cure sealant for unitized (in-shop) curtainwall construction. Curtainwall quality and performance improved, and the use of structural silicone glazing blossomed.

When world, weather and geologic events triggered the need for blast- and hurricane-resistant protective glazing systems, Dow stepped forward with an effective solution.

With breakthrough materials and innovation support from Dow, the construction industry has continued to push the structural silicone glazing envelope and succeed.

Challenging the elements...and winning

In the following pages, you will find a sampling of the thousands of structures around the globe that owe their lasting strength and beauty to structural silicone glazing breakthroughs and products from Dow. These structures typify the superior longevity and performance of DOWSIL™ structural glazing technology.

Through these projects, it is easy to see why, for more than 50 years, the global construction community has placed its trust in innovative structural glazing solutions from Dow.

"When these products became available, we were all talking about what kinds of information would give people a degree of confidence. Dow started doing various kinds of testing to prove that the materials would work. They did a lot of good basic test work that I'm not aware of anyone else doing at that time. Dow was one of the prime movers in getting properties tested and working with the rest of us at ASTM to develop industry-accepted standards for structural silicone glazing."

Tom O'Connor
Building Technology Studio Director, The Smith Group Architects of the world's first four-sided structural silicone glazing project – the Smith, Hinchman & Grylls (SH&G) building
Detroit, Michigan

Timeline

- **1964** The first structural silicone glazing application – the Total Vision System (2-sided structural glazing with glass mullions)
- **1968** Two-sided structural silicone glazing in curtainwalls
- **1971** The world's first four-sided structural silicone glazing system
- **1976** Two-sided structural silicone glazing with insulating glass
- **1978** Four-sided structural silicone glazing with insulating glass
- **1984** Fast-curing two-part structural silicone for faster, better, easier shop glazing of unitized curtainwalls
- **1992** Blast- and hurricane-resistant protective glazing
- **2010's** High design strength structural glazing
- **Tomorrow** The next structural silicone glazing revolution from Dow

BP Exploration Alaska

Anchorage, Alaska

Standing strong on shaky ground

Located in an active earthquake zone, the 16-story BP Exploration Alaska building stands on shaky ground. Twelve seismic events of Richter magnitude 7 or greater have occurred during its lifetime. Yet the performance of the DOWSIL™ structural silicone used in its construction has remained unshakable. When the building was erected in 1983, HOK Architects specified DOWSIL™ 795 Silicone Building Sealant to attach the insulating glass panels to the Kynar-painted metal in the building's two-sided, structurally glazed unitized curtainwall system. A wise choice. In addition to repeated ground tremblers, the structure has weathered more than 20 years of temperature extremes (from -37 to 29°C [-34 to 85°F]) and an annual precipitation rate of 414 mm (16 in.).

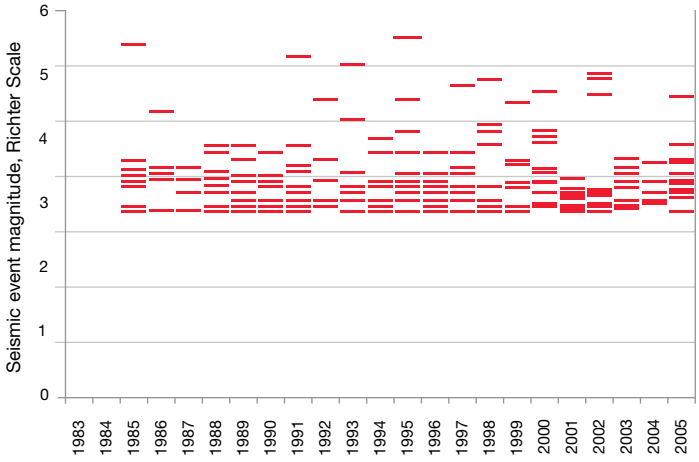
Key structural innovators:

- HOK Architects
- Olympian Stone
- Fenpro Contract Glass Co.
- Dow Silicones Corporation

Curtainwall details:

- 2-sided, unitized (factory-glazed) construction
- Sealant design strength: 138 kPa (20 psi)
- Sealant bite: 13 mm (0.5")
- Lite dimensions: 1880 x 2134 mm (74 x 84")
- Windload: 1.91 kPa (40 psf)
- Substrates: Insulating glass, granite, Kynar

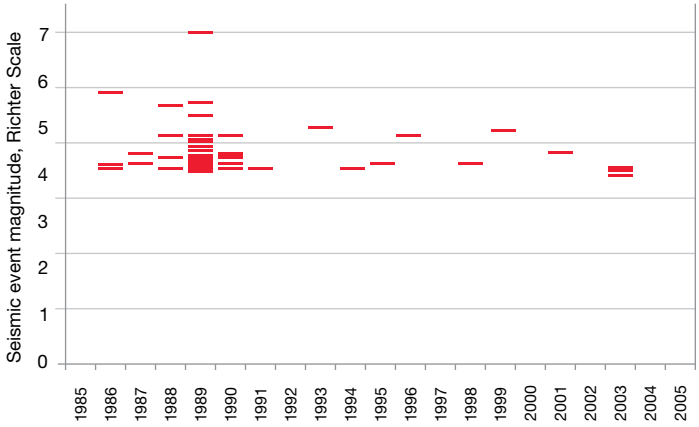
Seismic profile



Noteworthy

The U.S. Geological Survey estimates that there are 500,000 detectable earthquakes in the world each year. One hundred thousand of those can be felt, and 100 of them cause damage.

Seismic profile



World Savings Center

Oakland (San Francisco, California

Magnitude 7.1 performance

On October 17, 1989, a 7.1 magnitude earthquake struck Loma Prieta in the Santa Cruz, California, mountains, 105 km (65 miles) southeast of San Francisco. The worst California earthquake since 1906, the Loma Prieta quake did billions of dollars of damage to the San Francisco Bay Area. Less than 1 km (0.6 mile) from the World Savings Center in Oakland, an entire section of the Nimitz Freeway collapsed. But the World Savings Center simply shrugged and went about its business, with no damage to the structural silicone in its unitized curtainwall.

DOWSIL™ 983 Silicone Glazing and Curtainwall Sealant was used to adhere the monolithic tinted glass to the polyester powder painted metal when the building was constructed in 1985. Since then, the World Savings Center has been exposed to numerous seismic events, more than 20 years of natural weathering and, in 1995, to a wind storm with gusts in excess of 170 kph (106 mph). Yet no problems have ever been reported with the Dow structural silicone in its curtainwall.

Key structural innovators:

- Curtainwall: PPG Industries
- Curtainwall contractor: RPS Architectural Products
- Dow Silicones Corporation

Curtainwall details:

- 4-sided, unitized (factory-glazed) construction
- Sealant bite: 19 mm (0.75”)
- Lite dimensions: 1524 x 1828 mm (60 x 72”)
- Windload: 2.15 kPa (45 psf)
- Substrates: PPG grey float glass; Revere polyester powder coat paint

Center Tower

Costa Mesa (Los Angeles), California

Performance in motion

They say “it never rains in Southern California.” But even with an average of 260 sunny days each year, it sometimes pours. And seismic activity is common. At 4:30 a.m. on January 17, 1994, the greater Los Angeles area was shaken awake by an earthquake. According to the Southern California Earthquake Data Center, the Northridge quake produced the strongest ground motions ever recorded in a North American urban setting. Office buildings, freeways and parking structures collapsed. But the curtainwall on the Center Tower in nearby Costa Mesa held fast.

Erected in 1985, the unique shape of this 21-story building necessitated a structural silicone glazing design that would handle significant windload. The project was structurally glazed in the field using DOWSIL™ 795 Silicone Building Sealant. There has never been a reported problem.

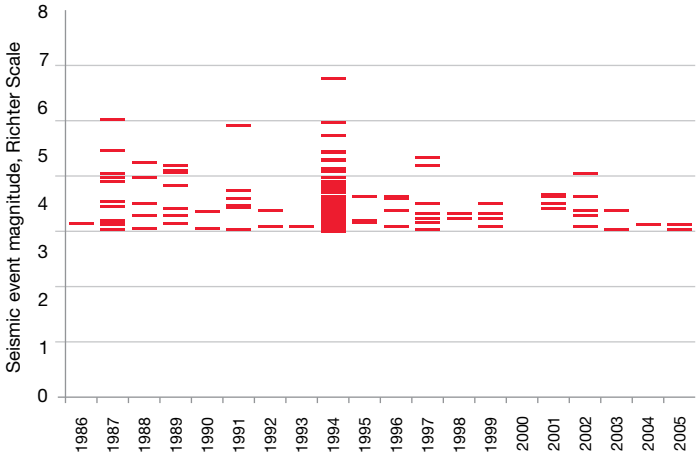
Key structural innovators:

- Architect: CRS Sirrine
- Consultant: Heitmann & Associates
- Curtainwall contractor: Benson Industries
- Dow Silicones Corporation

Curtainwall details:

- 4-sided, field-glazed construction
- Sealant design strength: 138 kPa (20 psi)
- Lite dimensions: 1524 x 1524 mm (60 x 60”)
- Sealant bite: 30 mm (1.175”)
- Windload: 5.27 kPa (110 psf)
- Substrates: Monolithic glass; Kynar-painted aluminum

Seismic profile



Washington Mutual Tower

Seattle, Washington

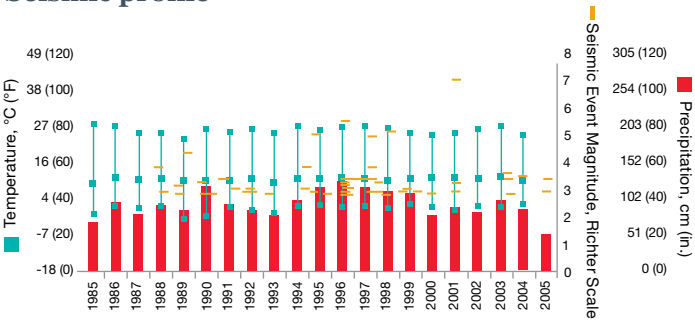
Holding back the damp

Standing tall in the "rain shadow" of the Olympic Mountains, the 55-story Washington Mutual Tower experiences few dramatic storms. Instead, it is continually shrouded in clouds and coated in drizzle, rarely seeing a sunny day. Moisture is a great degrader of construction materials, but in nearly 20 years of damp and gloom, punctuated by repeated seismic events, there have been no reported changes in the DOWSIL™ structural sealants used in the building's construction. Both DOWSIL™ 983 Silicone Glazing and Curtainwall Sealant and DOWSIL™ 795 Silicone Building Sealant were used to attach the insulating glass lites to the natural anodized aluminum in the building's four-sided structurally glazed unitized curtainwall. The building was completed in 1987.

Key structural innovators:

- Curtainwall contractor: Harmon Contract
- Contractor: Howard S. Wright
- Architect: McKinley Architects
- Dow Silicones Corporation

Seismic profile



Curtainwall details:

- 4-sided, unitized (factory-glazed) construction
- Sealant design strength: 138 kPa (20 psi)
- Lite 1 – Dimensions: 1524 x 1676 mm (60 x 66")
  - Sealant bite: 19 mm (0.75")
  - Windload: -3.83 kPa (-80 psf)
- Lite 2 – Dimensions: 1524 x 1803 mm (60 x 71")
  - Sealant bite: 25 mm (1")
  - Windload: -4.55 kPa (-95 psf)
- Substrates: Insulating glass, 6063 clear/natural alloy anodized aluminum

Noteworthy

The use of structural silicone glazing provides a natural thermal break between the glass and framing members. Attachment of insulating glass using this system results in no exterior exposed aluminum. The structural silicone attachment is also a barrier to the passage of air and water. This built-in thermal barrier keeps the interior framing members and insulation dry and comfortable.

Metropolitan Tower

New York, New York

Passing the acid test

The 67-story Metropolitan Tower was New York City's first structural silicone glazed curtainwall. In 1985 when it was erected, it was the tallest residential building in the city and the sixth tallest concrete structure in the world.

DOWSIL™ 983 Silicone Glazing and Curtainwall Sealant and DOWSIL™ 795 Silicone Building Sealant were used, successfully, to adhere the 70,000 panes of insulating glass to the Metropolitan Tower's extruded aluminum frame. Every year, the building is subjected to an average of 1092 mm (43 in.) of acid-laden rain. But the structural silicone joints in the Metropolitan Tower's curtainwall have remained steadfastly resistant to its degrading effects.

Key structural innovators:

- Building owner (at the time of construction): Harry Macklowe
- Consultant: Gordon H. Smith Corporation
- Architect: Schuman, Lichtenstein, Claman & Efron
- Curtainwall contractor and erector: Diamond Architectural
- Construction manager: HRH
- Curtainwall manufacturer: Glassalum Engineering
- Insulating glass manufacturer: Cardinal IG Corporation
- Dow Silicones Corporation

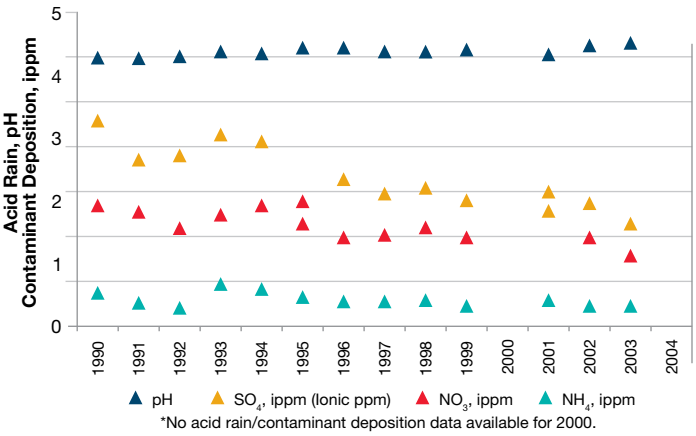
Curtainwall details:

- 4-sided construction
- Sealant design strength: 138 kPa (20 psi)
- Lite1 – Dimensions: 1365 x 1210 x 25 mm (53.75 x 47.625 x 1")
  - Windload: 4.79 kPa (100 psf)
  - Sealant bite: 19 mm (0.757")
- Lite 2 – Dimensions: 1480 x 603 x 25 mm (58.25 x 23.75 x 1")
  - Windload: 4.79 kPa (100 psf)
  - Sealant bite: 9.5 mm (0.375")
- Substrates: Gray-tinted insulating glass; Cardinal SS-20 reflective coating on gray glass; black-painted aluminum

Noteworthy

Acid rain erodes the surface of building material and causes corrosion and discoloration, cracking and pitting. It has accelerated the rate of deterioration of some of the world's most treasured monuments and historic structures.

Pollution profile



*No acid rain/contaminant deposition data available for 2000.

"When the curtainwall manufacturer tested the full-panel mockup for this building, a problem surfaced that could have jeopardized the entire project. The silicone glazing sealant they were using, an acetoxy-cure material, was incompatible with the secondary silicone seals in our insulating glass units, and it was causing them to lose adhesion and fail. We knew from experience that the only solution was to switch to a neutral-cure structural silicone, but the original sealant manufacturer didn't make one. We immediately got on the phone to Dow. They had exactly the material we needed and helped us get the project back on track."

Robert Spindler
Director of Technical Services
Cardinal IG Corporation

Exchange Square

Hong Kong

Where tropical weather met its match

In spite of tropical heat and humidity, frequent heavy rains and typhoons, and the degrading effects of air pollution, Exchange Square is a prominent and enduring feature of the Hong Kong skyline. Constructed in 1984, it was the largest structural silicone project of its time. DOWSIL™ 795 Silicone Building Sealant and DOWSIL™ 983 Silicone Glazing and Curtainwall Sealant were used to adhere the monolithic glass to Exchange Square's massive 200-m (656-ft) towers. For more than 20 years, these sealants have continued to perform as reliably as the day they were installed.

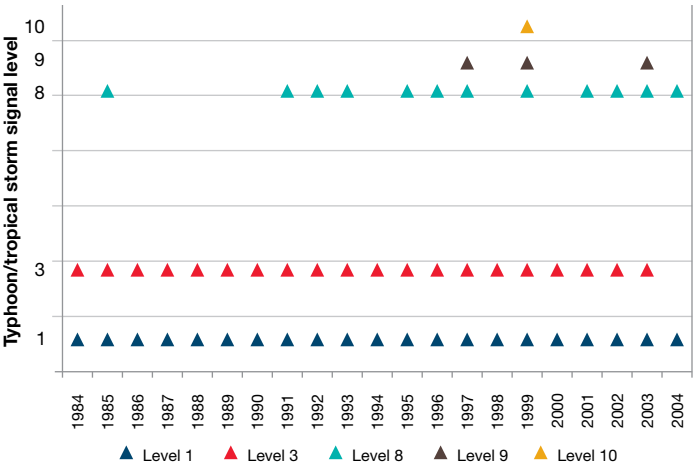
Key structural innovators:

- Architect: Palmer and Turner
- Curtainwall contractor: Gartner and Builders Federal HK
- Consultant: Victor Mahler
- Dow Silicones Corporation

Curtainwall details:

- 2-sided, unitized (factory-glazed) system
- Sealant design strength: 138 kPa (20 psi)
- Lite 1 – vision glass:
  - Dimensions: 1600 x 1280 mm (63 x 50.4")
  - Windload: 5.27 kPa (110 psf)
  - Sealant bite: 40 mm (1.57")
- Lite 2 – spandrel glass:
  - Dimensions: 770 x 1280 mm (30.3 x 50.4")
  - Windload: 5.27 kPa (110 psf)
  - Sealant bite: 40 mm (1.57")
- Substrates: Monolithic glass; 10,000 factory-glazed units, including glass and granite spandrel

Sustained wind speed profile



Noteworthy

The warm ocean waters of the Western Pacific and the South China Sea fuel some of the most powerful typhoons on Earth. One of the strongest, Typhoon York, scored a direct hit on Hong Kong in September 1999. Sustained wind speeds reached 150 kph (93 mph), and the city remained under a Number 10 storm signal alert for a record 10 hours.

Condomínio

São Paulo, Brasil

A fitting addition

The Condomínio River Park, which features two 70 m (230 ft) verticals joined by a gracefully curved plaza lobby, is a fitting addition to a city known for its modern high-rise architecture. Constructed from natural-color anodized aluminum panels and blue laminated glass over Corten steel, the building was structurally glazed in 1990 with DOWSIL™ 795 Silicone Building Sealant.

São Paulo's tropical climate is moderated by its altitude. The city seldom experiences temperatures higher than 30°C (86°F), and frost is rare. However, rainfall is abundant and constant humidity combines with vehicle emissions to create a serious air pollution problem. Moisture and pollutants can be damaging to sealants. But the DOWSIL™ 795 Silicone Building Sealant in the Condomínio River Park continues to perform as expected, untroubled by either the weather or the smog. At this rate, the sealant could exceed its 20-year capability promise.

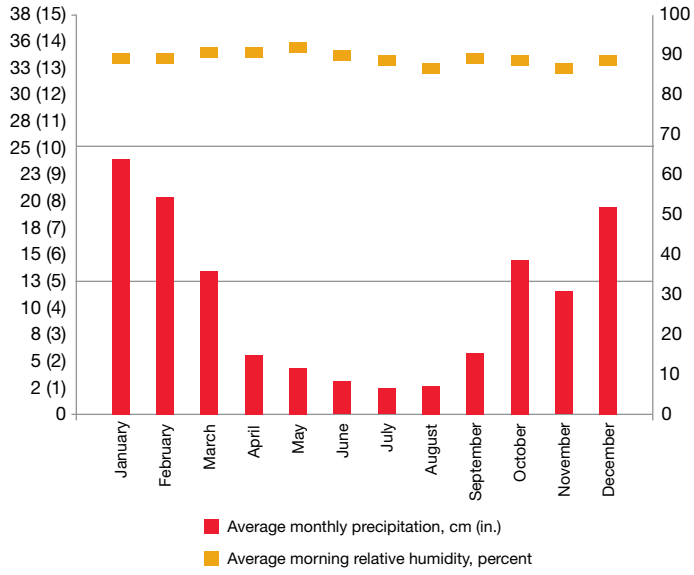
Key structural innovators:

- Architect: Botti Rubin Architects
- Curtainwall contractor: Algrad Frame and Special Facades Ltda.
- Dow do Brasil Ltda.

Curtainwall details:

- 4-sided, unitized (factory-glazed) construction
- Sealant design strength: 138 kPa (20 psi)
- Lite dimensions: 1850 x 1850 mm (72.8 x 72.8")
- Sealant bite: 17 mm (0.67")
- Windload: 1.2 kPa (25 psf)
- Substrates: Blue laminated glass, natural-color anodized aluminum plate panels, aluminum frame, Corten steel with a naval hardboard coating on gray glass; black-painted aluminum

Precipitation/humidity profile



Noteworthy

São Paulo is located directly on the Tropic of Capricorn, the parallel of latitude that marks the southern boundary of the tropics.

The many proven weathersealing and structural glazing products from Dow gave contractors the tools they needed to confidently accommodate multiple substrates and complicated transitions.

Science and Engineering Hall, George Washington University

Washington, D.C.

Higher learning: signed, sealed, delivered

Construction of the new state-of-the-art Science and Engineering Hall (SEH) at the George Washington University (GW) created the largest academic building of higher education in the District of Columbia. The approximately 500,000 squarefoot building design features complex geometry including hundreds of unique transitions and multiple substrates. The design entailed considerable coordination between multiple substrates with additional field-glazing challenges.

To address the challenges, curtain wall and glazing contractor Harmon Inc. turned to Dow for its weathersealing and structural sealing needs. “Dow provides the sealants to do the whole job—from shop to field,” said Ronald Borza Jr., Regional Superintendent for Harmon.

“We field-glazed over 80 lites of glass on this project using either DOWSIL™ 995 Silicone Structural Sealant or DOWSIL™ 121 Structural Glazing Sealant,” said Kandace L. Shortt, Senior Project Manager for Harmon. “DOWSIL™ 121 Structural Glazing Sealant allowed us to remove the temporaries after 24 hours, which helped the schedule tremendously.”

In addition to the curtain wall installation, the wide range of compatible, proven silicone construction materials from Dow helped address sealing needs for the variety of substrates used in the project.

Key structural innovators:

- Architect: Ballinger (Philadelphia)
- Curtain wall and glazing: Harmon Inc.
- Dow Silicones Corporation

Curtainwall details:

- Four-sided structural glazing; Sealant design strength: 138 kPa (20 psi)
- Fast-curing structural glazing sealant

Raffles City Chengdu

Chengdu, China

Specialized solutions for unique design

A mixed-use development located in Chengdu's city center, Raffles City Chengdu will become a landmark in the city and a new destination for local consumers, tourists and business travelers. The development includes an A-Level office building, a shopping mall, a five-star hotel, a service apartment and a boutique office area.

The irregularly shaped construction features large overhangs and pores—echoing the China Central Television Headquarters— with some sections of the curtain wall featuring a vertical outward tilt design. To address issues regarding this unique design, Dow confirmed the right sealant width design to fit the outward tilting curtain wall.

Apart from superior safety performances, DOWSIL™ sealants, including DOWSIL™ 995N Structural Glazing Sealant, ensure temperature and sound insulation as well as a reduction in energy consumption. This proven technology can also help this building to withstand against earthquakes, acid rain, typhoon, extreme humidity and heat, as well as erosion from UV radiation.

Key structural innovators:

- Architect: Steven Holl Architects
- Façade Consultant: Meinhardt Façade Technology Co., Ltd.
- Façade Installation: Shenyang Yuanda Aluminium Industry Engineering Co., Ltd.
- Developer: CapitaLand China

Curtainwall details:

- The curtain wall reaches 55,000 square meters in area and the low emissivity, energy saving insulating glass units (IGU) use a single silver Low-E glass

To overcome challenges faced during the design and construction process, Dow has continuously provided professional advice to both designers and contractors since the beginning of the project.

Quality Bond™ allows customers and specifiers to share in Dow's industry-leading expertise and benefit from our proven global performance track record.

Heathrow Airport Terminal 5

London, England

Reaching for the sky

Heathrow Airport's new Terminal 5, which opened in 2008, is one of the largest single-span structures in the UK. The building is a striking example of airport architecture consisting primarily of steel and glass. Ensuring bomb blast resistance posed a unique challenge for Dow in collaboration with First Tier Contractor, Seele. Because of the use of glass throughout the internal fitting of the project—including glass stairway balustrades, glass doors, glazed elevators and shafts—additional bomb blast loading was required.

DOWSIL™ 3362 Insulating Glass Sealant was specified to provide an insulating glass edge seal for the glass units installed throughout many elements including the outer skin, the roof lights, the car parks and sky bridges.

The joints between the toughened elevator glass sections were bonded using DOWSIL™ 993 Structural Glazing Sealant technology. This project is another example of Dow proven silicone products specified in an innovative and challenging application.

Key structural innovators:

- Lead Architect: Richard Rogers Partnership (now Rogers Stirk Harbour and Partners) Curtain wall and glazing: Harmon Inc.
- Structural Design consultants: Ove Arup and Partners Ltd
- Glazed Elevators Design & Build Contractor: Seele Austria GmbH & Co. KG
- Glass Manufacturer: Eckelt Glas GmbH
- Developer: BAA
- Curtain Walling Delivery Service: Schmidlin (UK) Ltd
- Insulating Glass Manufacturer: Polypane
- Dow Silicones Corporation

Messe Frankfurt

Frankfurt, Germany

Weathering it all

The third-largest trade fair complex in the world, located in Frankfurt, Germany, covers 476,000 m_2 (5,123,621 ft_2). Extreme variations in temperature, humidity, infrared and ultraviolet radiation in the region required the building to have sealants that can handle the most arduous conditions.

While the weather fluctuates, the DOWSIL™ 983 Silicone Glazing and Curtainwall Sealant and the DOWSIL™ 3332 Insulating Glass Sealant installed in this building's structural silicone glazing system in 1986 continue to thrive.

Key structural innovators:

- Curtainwall contractor: Waagner Biro (Austria) and HeFi – Fischer – Talheim (Germany)
- Architect: Murphy/Jahn (USA)
- Glass processor/IG-manufacturer: Okalux – Marktheidenfeld (Germany)
- Dow Silicones Corporation

Curtainwall details:

- 2-sided structural glazing system for the facade, 4-sided structural glazing for the glass roof, 2-sided structural glazing system for the pyramid-shaped roof

“People constantly raise the question about structural silicone glazing, ‘How long is it going to last?’ What we tell them is this: We have experience with structural silicone on buildings going back over 25 years. The failures we’ve seen have been attributed to poor workmanship. These failures usually occur shortly after installation and are not attributed to the silicone itself. We know of no non-workmanship attributed failures. We know of no long-term failures.”

Gordon H. Smith, P.E.
Gordon H. Smith Corporation

The Time Warner Center

New York, New York

The largest glass wall of its kind in the world

The seven-story stone and glass base of the Time Warner Center in New York City is fabricated with a steel frame. The towers that rise above it are constructed around 12.2 x 43 m (40 x 140 ft) concrete cores. The wall of the open mall that faces Columbus Circle is made of laminated glass panes attached to a non-rigid, 46 m (150 ft) high by 26 m (85 ft) wide cable mesh frame. Completed in 2004, it is the largest glass wall of its kind in the world.

With approximately 92,903 m_2 (1 million ft_2) of custom fabricated glass curtainwall, the performance of the structural sealants used in the center’s construction could not be left to chance. The curtainwall panels, which employed a combination of DOWSIL™ 983 Silicone Glazing and Curtainwall Sealant and DOWSIL™ 995 Silicone Structural Sealant, were subjected to an elaborate, 60-part test for air and water infiltration as well as structural performance. The sealants performed as expected – flawlessly.

Key structural innovators:

- Architect: Skidmore, Owings & Merrill, LLP
- Curtainwall manufacturer and contractor: Glassalum International Corporation
- Caulking contractor: RSG Caulking & Waterproofing, Inc.
- Consultant: Gordon H. Smith Corporation
- Dow Silicones Corporation

Curtainwall details

- 4-sided, unitized (factory-glazed) construction
- Substrates: Insulating glass, aluminum

ICE Kraków

Kraków
Poland

Silicones secure complex façade

Thanks to the opening of the Congress Centre in 2014, the ICE Kraków is the business and cultural flagship of the city. Located in the very heart of Krakow, it is a convenient place for the organization of diverse events – from international congresses, conferences, symposiums and business meetings, through cultural events such as concerts, opera, theatrical and ballet performances, to social meetings. Thanks to the opening of the Congress Centre, Krakow has an infrastructure that lets everyone enjoy their visit to the capital of Malopolska to the fullest extent – a prestigious facility, the atmosphere of the city and an extremely diverse cultural, culinary and commercial offer.

The building façade is comprised of a mixture of glass, ceramics and aluminium. The eastern side of the building is glazed to allow occupants to enjoy incredible city views, whilst the reverse of the building is covered with coloured ceramic tiles, which correspond to the interior colour-scheme. This dynamic use of substrates and colours is a reflection of the architect's desire to represent the vibrancy of the Debniki district on the right bank of the Vistula and which only joined the Kraków city limits in 1909.

DOWSIL™ sealants were extensively used for the façade construction. DOWSIL™ 3362 HD Insulating Glass Sealant was specified for the secondary seal of the insulating glass units, DOWSIL™ 993 Structural Glazing Sealant was used to structurally attach the glass units, DOWSIL™ 791 Silicone Weatherproofing Sealant for the movement joints around windows and doors and the DOWSIL™ PanelFix System secured the ceramic panels to the curtain wall frame.

Key structural innovators:

- Architect: Ingarden & Ewý Architekci Arata Isozaki & Associates
- Façade consultant: WB Projekt
- General contractor: Budimex S.A.
- Insulating glass and structural glazing fabricator: Quality Bond™ from Dow Member – Press Glass S.A., Poland
- System supplier: Quality Bond™ from Dow Member – Aluprof S.A., Poland
- Curtain wall contractor: Quality Bond™ from Dow Member – Alsal Sp. z o.o. Sp.K. Poland Quality Bond™ from Dow Distributor – Proventuss Poland

Prime Tower

Zurich Switzerland

Silicones seal and bond talles tower on Zurich's skyline

At 126 metres tall, Zurich's landmark building, the Prime Tower, is one of the country's tallest towers. Opened in 2011, it is based in the heart of the city which is synonymous with finance and more recently arts and popular culture and offers 40,000 m^2 of floor space spread over 36 floors.

This innovative and elegant octagon shaped tower constructed from glass tinged with green is part of a larger complex which includes two further annexes, Cubus and Diagonal. These offer accommodation for business, gourmet restaurants, shops and event centres. It has breath-taking views of the city and lakes through the glazed facade, which allows daylight to stream through the windows, adding to the comfort and luxury for the building occupants.

DOWSIL™ 993 Structural Glazing Sealant and DOWSIL™ 3362 Insulating Glass Sealant were specified due to their proven track record of safety and reliability and applied by Dow's Quality Bond™ audited applicators.

Key structural innovators:

- Building owner: Swiss Prime Site
- Architect: Anette Gigon/Mike Guyer
- Facade consultant: REBA
- Curtain wall contractor: Dobler Metallbau Werkstätten Deggendorf GmbH, Munich
- Insulating glass manufacturer: Saint Gobain Deutsche Glas Flachglaswerk Radeburg
- Constructors: The Prime Tower consortium comprising Losinger Construction AG, Zurich and Karl Steiner AG, Zurich

Burj Khalifa

Dubai, United Arab Emirates

Solving high altitude technical challenges

With a budget for this project exceeding $1.5 billion, the final height of the spectacular Burj Khalifa skyscraper soars to 828 m above ground level, holding the record for being the world's tallest building and also for the highest installation of an aluminium and glass facade.

Opened in 2010, this iconic project has overcome the greatest of challenges and technical difficulties, not least of which are the wind forces dominating the structural design of the tower, the logistics of moving men and materials at extreme heights and construction of the building envelope.

Managing the internal pressure foreseen within the insulating glass units due to the high altitude culminated in the specification of DOWSIL™ 3362 Insulating Glass Sealant.

DOWSIL™ 993 Structural Glazing Sealant was specified to bring additional security to the insulating glass units which were mechanically fixed to the superstructure.

Key structural innovators:

- Architects: Adrian Smith, Skidmore, Owings & Merrill
- Structural glazing fabricators: Far East Aluminium, Hong Kong Arabian Aluminium, UAE
- Insulating glass fabricators: White Aluminium, UAE
- Main contractor: Samsung Engineering & Construction
- Developer: Emaar Properties

Supporting the industry

For more than 60 years, Dow has provided the construction industry with groundbreaking solutions – from the industry's first silicone structural glazing sealant to non-staining sealant technology for aesthetically sensitive substrates.

Dow offers a reliable, worldwide supply of top-quality silicone adhesives, sealants, coatings and chemicals for applications from structural glazing to weatherproofing, plus a full range of construction project support services.

Quality-conscious architects, contractors and building owners around the globe depend on Dow for innovative technology, proven performance, outstanding technical support and one of the most extensive warranty systems in the industry.

Quality Bond™

The high quality of crystal clear bonding is reinforced through the well established Quality Bond™ Program. Quality Bond™ lifts silicone sealing and bonding to the highest level through the instigation of standards of best practice in quality control, quality assurance and product application by specialist silicone fabricators and applicators. Quality Bond™ allows customers and specifiers to share in Dow's industry leading expertise and benefit from our proven global performance track record. For more information, please visit **qualitybond.com**. Quality Bond™ is currently available in Europe, the Middle East, Africa, India, ASEAN and Greater China.

For more information

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

Dow has sales offices, manufacturing sites and science and technology laboratories around the globe. Find local contact information at **dow.com/contactus.**

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