

HIGH PERFORMANCE BUILDING SOLUTIONS

# Solutions for construction from Dow supporting efforts in sustainable building

**DOW**





## Meeting your goals for LEED certification

Creating sustainable and environmentally conscious buildings and structures is increasingly important. A long-time contributor to the building industry, Dow recognizes the urgency to deliver long-term sustainable materials and solutions to help ensure the future of our planet. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) program exemplifies efforts in these regards, promoting standards for sustainable buildings.

LEED certification was developed by the U.S. Green Building Council (USGBC).

For more information, please visit [usgbc.org](http://usgbc.org)

## Sustainable approaches from Dow

Beyond products that directly contribute to LEED certification, Dow embraces sustainable technologies applicable throughout manufacturing and construction processes.

### Increasing energy performance through structural glazing and window glazing

Buildings account for 17-40 percent of total energy consumption. Properly designed building envelopes increase energy savings.

- Flexible anchors provided by DOWSIL™ silicone structural glazing systems minimize air infiltration, resulting in the potential for more energy-efficient performance.
- Thermal modeling programs demonstrate the thermal gains of silicone bonding in residential window manufacturing.

### Enabling next-generation renewable resource capabilities

Dow application solutions are enabling the next generation of renewable energy resources with silicone components and materials such as sealants, adhesives, heat transfer fluids, lubricants, high-temperature gaskets and high-voltage insulators. Dow works with partners throughout the world who are innovating and expanding both the photovoltaic and thermal solar markets.

On The Cover

**Solano County Government Center**  
Fairfield, California

Solano County's first LEED-certified building, the six-story, \$113.5 million project incorporates sustainable design/build elements, including extensive use of solar electricity and an award-winning co-generation plant. DOWSIL™ silicone sealants complement its energy-efficient technologies with excellent weatherproofing and outstanding life-cycle value.



Photo courtesy of  
Michael O'Callaghan



## Extending building life for long-term sustainability

With inherently longer life cycles and application durability than their petroleum-based organic counterparts, silicones resist natural breakdown from environmental factors. With over 40 years of proven performance, Dow silicone sealants have been used in building envelope, curtainwall and weatherproofing applications to withstand hurricanes, earthquakes, acid rain, typhoons and extreme humidity, heat and freeze conditions.

Additionally, silanes and silicone water repellents – by reducing damage from water penetration – help buildings last longer and retain more of their original materials. This durability minimizes needed repairs of the structures, enabling simplified restoration and reducing the energy needed for maintenance, reducing sealant in landfills and ultimately reducing VOC content from entering the environment from sealant replacement.

## Packaging with recycling and waste reduction in mind

Innovative Dow packaging design minimizes waste, utilizes recycled content and encourages reuse.

Sausage packs reduce sealant waste in the field.

Pails and cartridges are made with recyclable polyethylene; fiber drums use 25% recycled steel in the chimes, covers and bands.

Water-based, on-site dilutable products packaged in reusable containers eliminate the need for drum and solvent packaging, as well as possible hazardous waste disposal.

IBCs (intermediate bulk containers) are recyclable.

## Reducing transportation resources and costs

With over 30 global manufacturing sites in locations spanning China, India, Japan, Europe and the USA, Dow's strategically placed localized facilities enable improved local service and supply for customers worldwide – minimizing transportation costs. Additionally, by providing concentrated, water-dilutable products, many Dow products, such as water repellents, can be prepared with on-site water, eliminating the transportation of solvents or water content.

## Formulating environmentally responsible product offerings

Silicones are generally inert when cured and can be recycled at end of life when segregated from other waste. Many Dow products, including construction primers, adhesives and sealants, are low-VOC formulations. Silicone sealants featuring primerless adhesion eliminate the need for primer, further reducing their environmental footprint.

## Expanding design options for aesthetics and performance

DOWSIL™ sealants, adhesives and coatings enable numerous performance improvements. With structural glazing, exposed insulating glass, bonded windows and integrated structure capabilities, proven silicone materials, with their superior movement capabilities, provide incredible design opportunities. Coupled with the potential of silicone treatments to increase the durability and use of materials such as gypsum board and FRC products on building exteriors, architects and engineers are equipped with a widening range of choices to create sustainable, attractive structures.

## Setting new standards in sustainable building techniques

In addition to offering application expertise and educational opportunities, Dow is actively involved in setting standards for the industry to enable improvements in sustainable building techniques.

### Chippewa Nature Center Visitor Center Midland, Michigan

With a comprehensive renovation and expansion of the Visitor Center and surrounding area, the Chippewa Nature Center is designed to be a bright and welcoming lifelong learning center for both nature and environmental education and a demonstration center for green living. The LEED-certified building is a model of sustainability.



Photo courtesy of Chippewa Nature Center

# LEED certification and beyond – Supporting sustainable design around the globe

DOWSIL™ silicones do more than help earn points toward LEED certification. Silicone materials and expertise from Dow help construction professionals from Antarctica to Beijing create more sustainable buildings

## Energy and Atmosphere (EA)

In this largest single area for LEED credit, optimizing the energy performance of a building is the most significant category, accounting for 19 points.

A recent thermal modeling study of typical curtainwall glazing systems revealed the best performance was achieved by a hybrid system of silicone structural glazing sealant and silicone foam warm edge insulating glass (IG) spacers.

Seven additional points are available for on-site renewable energy. Renowned for their UV stability and moisture resistance, Dow silicone sealants are ideal materials for sealing solar panel frames and junction boxes. Because they can withstand the sun's unrelenting rays year after year, DOWSIL™ brand solar solutions are used throughout the solar module assembly and installation process.



Princess Elisabeth Station, Antarctica is the first entirely sustainable research station to be constructed in the Antarctic. The station was designed to be highly energy-efficient, incorporating an energy control system, the use of energy-efficient appliances and sound insulation techniques, including energy-saving windows made possible by DOWSIL™ brand window sealant technology.

## Materials and Resources (MR)/Indoor Environmental Quality (EQ)

Using Dow materials in combination with other construction materials can have a direct effect on the following areas with specific LEED credits, including:

- **Recycled content (MR)**
- **Regional materials (MR)**
- **Low-emitting materials – adhesives and sealants (EQ)**

Visit [consumer.dow.com/construction](http://consumer.dow.com/construction) to learn more about the LEED credit contribution of Dow silicone sealants.

## Multifunctional design

Developing a sustainable building can require many functions that work together creating a desirable structure. For example **Materials and Resources (MR), Indoor Environmental Quality (EQ), Energy and Atmosphere (EA)** and **Site Selection (SS)** can all be positively affected through well thought out designs incorporating Dow materials, as illustrated by these 3 world-class buildings.





### **St. Pancras – International Station, UK**

A Dow silicone structural glazing sealant enabled the London & Continental Railways to transform a giant Victorian train shed into a breathtaking swath of light. The sealant was also used to attach the glass paneling in the corridors and stairways leading to the service platforms. Together, these applications meld the British architectural glamour of today with the beauty of years gone by.

Access to public transportation (SS), maintaining existing building walls (MR), maximum day lighting (EQ) and optimized energy performance (EA) are enhanced with the design that incorporates Dow materials.



### **New Beijing Poly Plaza**

The New Beijing Poly Plaza boasts the world's largest flexible-cable glass curtainwall. The curtainwall, which blurs the dividing line between indoor and outdoor spaces and integrates the building with its surroundings, was constructed using a Dow silicone structural glazing sealant chosen especially for its superior stress-bearing capabilities. Travertine stone blinds on the south and west sides of the building ensure maximum sunlight in winter and offer protective shading in summer, reducing heating and air conditioning requirements. A high-performance Dow sealant made for aesthetically sensitive substrates was used to seal the stone.



### **Torre Agbar, Barcelona, Spain**

The dazzling multicolored skin on the Torre Agbar features an outer shell of more than 50,000 glass louvers that can be moved to control the amount of light and solar heat gain entering the building. Within the louvers are 4,400 opening windows, which allow natural ventilation of the offices inside. A Dow silicone structural glazing sealant, chosen for its unique strength/ flexibility ratio and proven track record of durability, was used to bond the louvers to their frames.

## For more information

Learn more about Dow's full range of High Performance Building solutions by visiting us online at [dow.com/highperformancebuilding](http://dow.com/highperformancebuilding).

Dow has sales offices, manufacturing sites and science and technology laboratories around the globe. Find local contact information at [dow.com/contactus](http://dow.com/contactus).



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