



CASE STUDY : OLYMPIC HOUSE

Dow silicones help IOC achieve sustainability goals at their new headquarters



The project

The Olympic House in Lausanne is the new headquarters of the International Olympic Committee (IOC). Olympic House draws on strong roots and traditions, while revealing a contemporary outlook that reflects the Olympic Movement's ambition for the future. More than an office building that brings all the IOC staff under one roof, Olympic House is a symbol of openness and unity as well as an investment in operational efficiency, local economy and development, and sustainability.

Olympic House has been designed around the four concepts of Integration (into the natural landscape), Athletes at the heart (shape inspired by movement), Peace (solar panels on the roof representing a dove), and Unity (five-ring central staircase). The building authentically reflects Olympism, the Olympic Movement and the role of the IOC as a catalyst for collaboration in an iconic form.

At the heart of the Olympic House project engineering success was the efficient and high level of internal and external collaboration between the many different stakeholders including Dow, who helped the IOC deliver on its objectives. As a result, the Olympic House achieved three very demanding sustainability standards:

- LEED: the most widely used green building programme in the world which provides a framework to create healthy, highly efficient and cost-saving buildings. Olympic House is certified according to LEED v4 Platinum. It is the LEED v4 building having achieved the highest score worldwide (93) to date in the 'new construction and major renovations' category



City and country

Lausanne, Switzerland

Products*

- DOWSIL™ 993 Structural Glazing Sealant
- DOWSIL™ 3363 Insulating Glass Sealant
- DOWSIL™ 791 Silicone Weatherproofing Sealant

Key participants

- **Building owner**
International Olympic Committee
- **Architects**
Consortium: 3XN Architects
Copenhagen (Denmark)/Itten
Brechtbühl (Switzerland)
- **Curtain wall contractors**
Frener & Reifer GmbH / Srl
Roschmann Group
- **Façade engineers**
Emmer Pfenninger Partner AG
(all façades + skylight)
- **Structural bonding fabricators**
MGT Mayer Glastechnik
GmbH/Srl
Structural Engineers
REBA Fassadentechnik*
- **Civil engineers (building)**
INGENI SA Lausanne

*Sub-consultants to Frener & Reifer, involved in level 01-03 façades only

- SNBS: the Swiss national sustainability construction standard which covers the three dimensions of sustainability, i.e. environmental sustainability, social sustainability and economic sustainability. The Olympic House was one of the five pilot projects in Switzerland (the only one in French-speaking Switzerland) chosen to finalize the certification before its official launch. Olympic House is the second building – and the first international headquarters – to obtain the highest level of SNBS.
- Minergie: the Swiss energy efficiency standard guarantees that the building consumes less energy per square metre than average Swiss buildings

DOWSIL™ Brand Silicone Sealants were extensively used for the glass façade assembly due to their proven track record of durability, reliability and long-term structural performance. DOWSIL™ 3363 Insulating Glass Sealant was selected for its energy efficiency and high strength secondary sealing of the argon-filled, triple-glazed insulating glass units. DOWSIL™ 993 Structural Glazing Sealant was specified to structurally attach the glass units to the curtain wall frame. DOWSIL™ 791 Silicone Weatherproofing Sealant was used to achieve air-tightness and accommodate building movement in the external weather sealing joints in the glass façade.

The challenge

With sustainability and the wellness of building occupants embedded into the blueprint of the Olympic House from day one, the architects 3XN/IttenBrechtbühl were tasked with creating a design that permitted accessible outdoor views and swathes of natural daylight to embrace the building. This building is an important contributor to the IOC's goal to reduce its carbon footprint.

A crucial challenge was balancing these deliverables with an energy efficient and iconic façade that met the design brief and sympathetically integrated the structure into the surrounding landscape. The selection of construction materials during the design phase of this project had a crucial impact on its embodied carbon footprint, future energy conservation goals and operational footprint.

With glass being the natural selection for the greater part of the building façade, realising the best way to increase the amount of glass using less aluminium framework to empower architectural design freedom without compromising building efficiency, was also key.

The final building envelope is also required to accommodate movement, transfer wind loads from the glass to the framework, support long-term structural capability and provide sound control and weather protection.

The solutions

DOWSIL™ silicone solutions were specified for structurally bonding and sealing elements of the double skin glass façade. This was due to their track record of longevity, proven performance and their ability to conserve energy, improve acoustic performance, enhance aesthetics and enable building designs that increase daylight opening and living comfort for occupants. Our dynamic group of design and performance experts worked in full collaboration with stakeholders to ensure that the project's aesthetic, wellness and sustainability goals were met.

The ground floor

The glass wall surrounding the ground floor was created using argon-filled triple-glazed insulating glass units which were edge sealed with DOWSIL™ 3363 Insulating Glass Sealant. This high strength silicone has been engineered for efficiency and performance allowing for smaller, more economical joints which exceed the design strength of conventional sealants and grant a more visible glass area for additional daylighting. Smaller joint dimensions mean faster edge sealing of the glass during production, enabling a higher volume output and valuable contribution toward productivity and cost efficiency. DOWSIL™ 3363 Sealant has also passed ETAG 002 which ensures that even under different climatic loads, the glass deflection and movement at the insulating glass edge is reduced. This helps to ensure that the primary butyl seal of the insulating glass unit maintains its gas retaining function for longer term performance. The ETAG 002 standard refers to an average lifecycle of a façade of 25 years. First studies on 2-part structural glazing indicate that DOWSIL™ silicones can have a life cycle of more than 75 years.

The joints between the insulating glass units were weather sealed with DOWSIL™ 791 Silicone Weatherproofing Sealant to ensure air-tightness. Roschmann Group carried out the silicone application and installation at the ground floor level.

The inner façade — 1st to 3rd floors

The inner façade of the envelope was also triple glazed, using DOWSIL™ 3363 Insulating Glass Sealant to provide a secondary perimeter sealant for the argon-filled glass units that were fixed to the curtain wall frame only at the top and bottom of the units. The UV resistance and durability of the DOWSIL™ 3363 Sealant in this situation is of paramount importance where increased protection and energy preservation is required in exposed areas.

DOWSIL™ 791 Silicone Weatherproofing Sealant was installed on the vertical movement joints to reduce uncontrolled air-leakage, improve energy efficiency and provide sound control. Its outstanding flexibility ensures the building stays air-tight as the sealant can accommodate up to 100% movement of the construction joints.

The triple glazed insulating glass was provided by Schollglas and Frener & Reifer who carried out the design, fabrication (glass) installation and weathersealing.

The outer façade — 1st to 3rd floors

The outer façade of the envelope was constructed from a bespoke curtain walling framing system and laminated glass to satisfy the unique design of the building. The use of laminated glass provides excellent retention in the event of glass breakage. These glass units were structurally attached on four sides using DOWSIL™ 993 Structural Glazing Sealant to the aluminium frame on the outside wall of the double skin curtain walling system, without the need for any additional mechanical retention, meaning the deadload is completely supported by the structural sealant alone. DOWSIL™ 993 Sealant offers almost unlimited design freedom and the opportunity to create frameless, uninterrupted expanses of glass for transparency and beauty. It's proven temperature resistance and durability against inclement weather underpins its suitability for use in all climates.

In addition to the design and fabrication, the curtain wall installation was performed by Frener & Reifer and the glass was supplied and structurally bonded by MGT Mayer Glastechnik GmbH.

Structural bonding and sealing with confidence

Structural glazing

Dow has more than 50 years of expertise in structural glazing. Our oldest four-sided silicone structural glazing project was constructed in the 1970's and is still functioning according to its intended performance. A recent scientific study using DOWSIL™ silicone removed from the 25-year old facade of the ift Rosenheim showed that the silicone still successfully passed ETAG 002-1, theoretically proving the sealant performance for an additional 25 years. In another study, DOWSIL™ structural silicone specimens were exposed to a 50-year simulation severity test for durability at the Federal Institute for Materials (BAM). It was confirmed that DOWSIL™ 993 Structural Glazing Sealant would continue to meet ETAG 002-01 for an estimated 50-year period for residual tensile strength and adhesion.

Weatherproofing

During a 2013 façade update, it was found that after 60 years of in-place weathering on a building on the western shore of Lake Michigan, the 1958 applied DOWSIL™ silicone weatherproofing sealant remained well-bonded to the glass substrates on approximately 90% of the building.

For more information and to download our brochure titled 50+ Years of Proven Silicone Performance, please visit dow.com/50plus.



For more information

Learn more about Dow's full range of High Performance Building solutions by visiting us online at 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.

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