

Case Study



CONSOL Energy Center

PITTSBURGH, PA

Owner

Pittsburgh Sports & Exhibiton Authority

Architect/Designers

Populous
Kansas City, MO

Astorino
Pittsburgh, PA

Vitro Products

Solarban® 60 Optiblu®
solar control low-e glass

Construction Managers

PJ Dick, Inc.
Pittsburgh, PA

Hunt Construction Group
Scottsdale, AZ

Glazing Fabricator

Trulite Glass and Aluminum Solutions

Glazing Contractors

Universal Glass and Metals
Detroit, MI

D-M Products, Inc.
Pittsburgh, PA

Curtain Wall Manufacturer

Kawneer
Norcross, GA

PROJECT BACKGROUND

CONSOL Energy Center (now PPG Paints Arena) was the first National Hockey League (NHL) arena to earn LEED® Gold certified. The building's signature element is a massive glass façade that faces downtown and undulates to emulate the flow of Pittsburgh's three rivers. Solarban® 60 Optiblu® (formerly Solarban® z50) solar control, low-e glass by Vitro Architectural Glass (formerly PPG glass) provided the right combination for light, views and thermal performance.



Jim Schafer Photography

The CONSOL Energy Center in Pittsburgh, home to the Pittsburgh Penguins of the NHL, features a massive, undulating glass façade fabricated from Solarban® 60 Optiblu® low-e glass by Vitro Architectural Glass (formerly PPG Glass).

CONSOL Energy Center | Pittsburgh, PA

The owners of the NHL's Pittsburgh Penguins wanted a green building that was just as friendly to the environment as it was to hockey fans. They hired Kansas City-based Populous, which then partnered with Astorino, a Pittsburgh architectural, engineering and interior design firm. The two companies had previously worked together on Pittsburgh's PNC (baseball) Park.

The building's design features a soaring six-level atrium and wide open concourse that enhances city views and helps visitors stay visually connected to the action on the ice.

Populous architect Jason Carmello said glass was the obvious material of choice for the project. His firm specified *Cradle to Cradle Certified™ Solarban® 60 Optiblu®* glass for its subtle, steel-blue-gray tint, a solar heat gain coefficient (SHGC) of 0.31, and visible light transmittance (VLT) of 51 percent. The resulting light to solar gain (LSG) ratio of 1.65 is up to 30 percent higher than current competitive blue-gray-tinted, low-e glasses. Despite extensive use of glass at CONSOL Energy Center, LEED documentation showed annual energy cost savings of more than 30 percent.

Three companies helped solve the design and logistical challenges associated with the curvy, multi-level curtain wall, which was fabricated from 12-by-4-foot lites of 1 inch insulating glass, each weighing 350 pounds. Kawneer, the building and construction systems business for Pittsburgh-based ALCOA, manufactured the framing for the curtain wall. D-M Products, Inc., of Pittsburgh, and glazing contractor Universal Glass and Metals, Inc., of Detroit, installed it.

Tom Kesler, project manager for Universal, said the weight of the glass units, together with the site orientation, made installation difficult. "These were large pieces of glass.



A precipitous change in elevation across the building site led to the creation of a soaring six-level atrium and wide open concourse that enhance city views and helps visitors stay visually connected to the action on the ice. CONSOL Energy Center in Pittsburgh is the first NHL arena to be LEED® Gold certified.

The curtain wall follows the same serpentine shape (as the building façade) while going up a steep hill," he explained. "We used a crane to set the glass, in conjunction with swing stages and lifts."

Carmello said the interior layout of CONSOL Energy Center and the transparency of *Solarban® 60 Optiblu®* glass combine to let light penetrate far into the arena, maximizing the aesthetic and environmental advantages of the glass façade.

To achieve *Gold* certification, CONSOL Energy Center earned 42 LEED points, which is unusual for a 700,000 square-foot building with so much open space and energy-intensive technology. Only 39 points were needed to earn Gold certification.

Additional green features included:

- Water use reduction (42.8% by volume)
- Recycled materials (31.2% of total building material value)
- Regional materials (31.4% of total building material value)
- Demolition & construction waste diversion (93.7% by weight)
- FSC certified wood (82% of total new wood material value)

Catherine Sheane, Sustainability Design Manager for Astorino, said cooperation among all the stakeholders was the key to achieving their bold ambition. "Early decision-making and buy-in on the sustainable design and construction components truly facilitated the follow-up and documentation. It's exactly the way a green building should be built."

To learn more about *Solarban® 60 Optiblu®* glass and the entire line of high-performance Vetro Glass products, visit vetroglazings.com or call 1-855-VTRO-GLS (887-6457).

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