Fluon® ETFE Fluoropolymer Film Enhances World Cup Arena's Exterior Facade

Seven years ago Brazil was picked to host the World Cup competition, setting in motion a waterfall of decision-making that will affect the country long after a champion is crowned. Looking at cities that ended up bankrupt after building facilities for the Olympics, Brazilian authorities wanted to guarantee that taxpayers were not stuck with hulking "white elephants" that would serve no purpose after the World Cup concluded.

In 2011, Chuck Steedman, senior vice president of partner company AEG Facilities, said, "It's a tremendous opportunity that Brazil has for the 2014 World Cup. For the next four years, the entire world is going to focus its attention here; that's outstanding, but we are worried about the next 30 years beyond that. We're worried about what happens the day after the World Cup leaves Brazil."

To ensure the desired lifetime of usefulness, Arena Pernambuco in the coastal city of Recife was designed and built to be part of the Ciudad da Copa (Cup City). It is a 1-square-mile zone of residences, offices and entertainment venues. To integrate the stadium into this zone and ensure its attractiveness over its lifetime, the arena's façade was constructed of Fluon® ETFE high-performance fluoropolyer film. This unusual material gives the stadium a futuristic, rounded appearance and transfers natural light inside the facility, reducing its dependence on electricity.

The 46,000-seat Arena Pernambuco boasts six levels, comprising 102 corporate boxes, 42 food kiosks and two restaurants. Brazil's biggest engineering and construction firm, Odebrecht, built the stadium and will also manage it for the next 35 years. The facility cost R$500 million (US$228.6 million) to complete.

Approximately 25,000-square-meters of AGC's 0.25 mm-thick Fluon ETFE film was used across the arena's exterior. Fluon ETFE film has been used successfully for years for membrane structures and architectural façades, including commercial buildings and sports facilities in Europe and Asia.

ETFE film provides superior weatherability, allowing it to withstand extreme temperatures. ETFE also exhibits excellent thermal stability, chemical resistance, transparency and non-sticking properties. One additional advantage of using ETFE film is tear strength; it will not easily rip or scratch over time.

Fluon ETFE film provides better than 90% light transmission. This allows sunlight to penetrate into the stadium's walkways and common areas while preserving a temperate atmosphere inside. It also gives facility operators to create dramatic visual effects using installed backlighting that will show for miles outside the stadium.

ETFE film is also lighter than glass, which gave the designers flexibility to create a functional building that is also visually appealing from the outside.
It is also surprisingly strong, with a maximum tension of 3.5K N/m, so its strength to weight ratio is favorable compared to glass. The installation at Arena Pernambuco started by erecting an extruded aluminum channel frame tied into the building's structure. The film segments were then installed using rubber packing to hold it in the channels. Workers then snapped and screwed aluminum finish plates onto the frame sections.

For more information, click here to watch a video showing installation of this material at the AGC Kashima factory in Japan. This video explains the performance and the advantages of ETFE film as an architectural material and shows the fabrication process for an architectural application.

About AGC Chemicals Americas, Inc.
AGC Chemicals Americas, Inc., is a wholly owned subsidiary of the Asahi Glass family, a $15 billion multinational corporation and one of the world's largest manufacturers of glass, electronic displays and chemical products. The company was formed in 2004 through the merging of sister companies Asahi Glass Fluoropolymers USA and AGA Chemicals. Headquartered in Exton, Pa., AGC Chemicals Americas maintains manufacturing operations in nearby Thorndale, Pa., and warehouses located throughout North America.
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