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WRAPPING UP THE OLYMPICS

STRICT SUSTAINABILITY GUIDELINES ENCOURAGED INTENSE COLLABORATION IN THE RESEARCH AND MANUFACTURE OF THE FABRIC PANELS THAT WRAPPED LONDON'S OLYMPIC STADIUM.



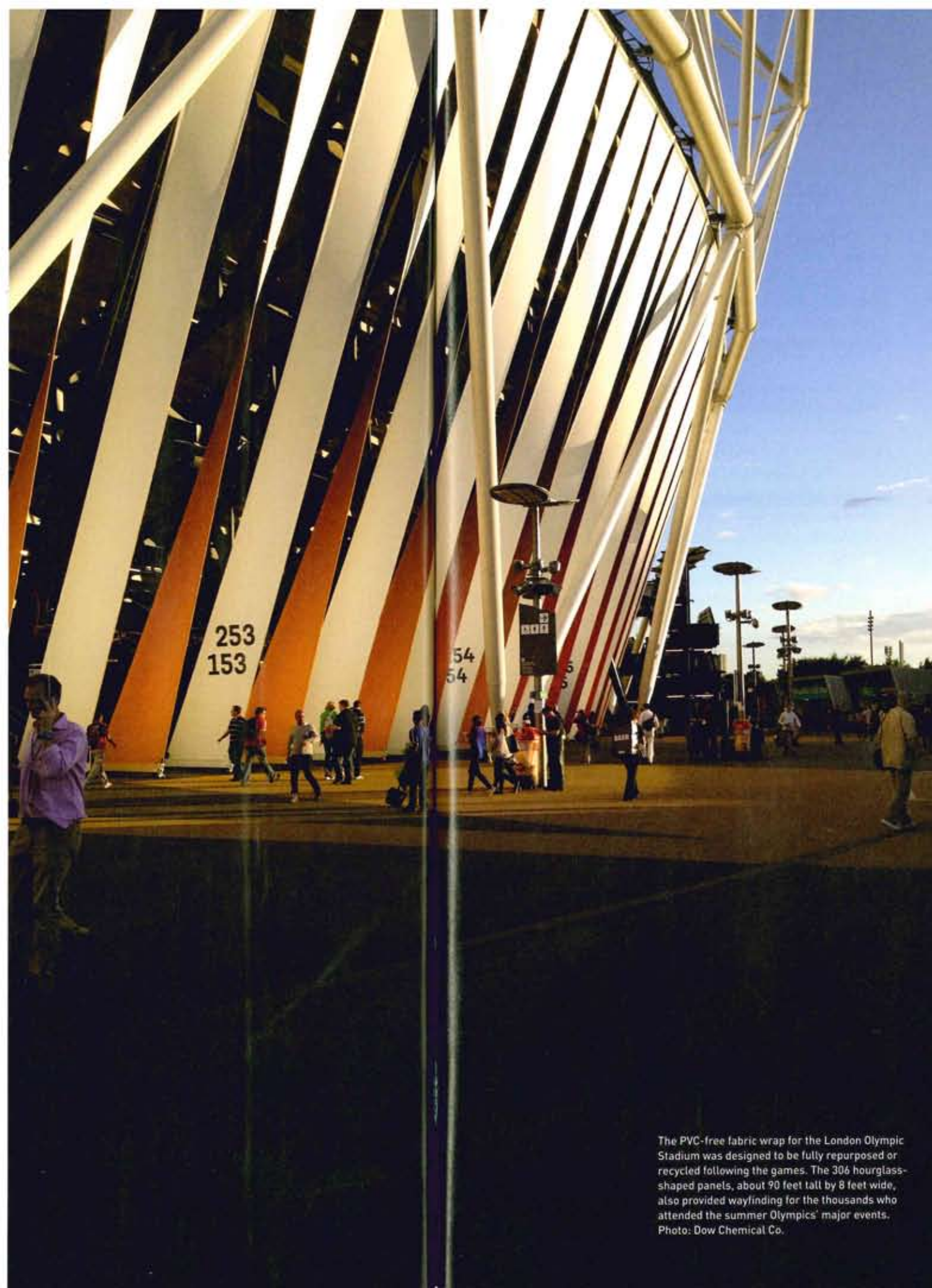
Photo: Getty Images

It was estimated that at one time or another during the 2012 Olympic Games in London, England, a total of nearly four billion people tuned in to watch the Olympic triumphs and tragedies. Much has been said about the training, preparation, glory and heartbreak that the athletes experience, but there are other medal-worthy efforts from these games.

One of the most interesting involves a dedicated team of internationally and nationally known companies that worked together to produce a sustainable fabric wrap that encircled the iconic Olympic Stadium.

As a major American corporate sponsor of the Olympics, The Dow Chemical Co., Midland, Mich., was committed to the rigorous sustainability and environmental standards set forth by the London Organizing Committee of the Olympic and Paralympic Games (LOCOG). Dow stepped in to sponsor the wrap originally called for by the stadium architects after public funding was withdrawn for that portion of the project in early 2011. (Construction of the elliptical-shaped stadium itself began in May 2008 and was completed nearly three years later.)

The next step was identifying the right partners in this eco-conscious mission, with its strong focus on sustainability—and at that point, the clock was ticking. “Thus began the collaboration with the Cooley Group and Rainier Industries,” says Nicoletta Piccolrovazzi, Dow’s technical director of Olympic operations. “To meet the fire performance and other sustainability and performance requirements required a breakthrough. That’s when we started the intense collaboration because we were charged with supplying the materials and manpower to help complete the Olympic Stadium as its architects had intended.”



The PVC-free fabric wrap for the London Olympic Stadium was designed to be fully repurposed or recycled following the games. The 306 hourglass-shaped panels, about 90 feet tall by 8 feet wide, also provided wayfinding for the thousands who attended the summer Olympics’ major events. Photo: Dow Chemical Co.



Top: The London Organizing Committee of Olympic Games (LOCOG) committed to hosting the most sustainable games in the games’ history. To this end LOCOG said, “Where possible we have used existing venues ... Where there is a legacy need, we have built new venues—the Olympic Stadium, the Aquatics Centre and the Velodrome—and where there is no need, we have built temporary venues in iconic places.” Photo: Getty Images.

Above: The fabric panels made with Cooley’s engineered-fabric membrane coated with resins made by Dow’s performance plastics division, boasts durability, printability, fire retardancy and recyclability. The new fabric is now an active part of Cooley’s EnviroFlex® line. According to the companies, the wrap is 35 percent lighter than earlier materials and it has a lower carbon footprint. Photo: Dow Chemical Co.

Footprint for the future

To meet the design and sustainability requirements, Cooley needed to come up with a PVC-free, low-carbon footprint, recyclable wrap to be used in what would end up as 306 hourglass-shaped panels approximately 90 feet tall by 8 feet wide.

"There was also a very strict standard for fire retardancy," says Dan Dwight, CEO of the Pawtucket, R.I.-based Cooley Group. "That's where it started to get really complicated [However], the Olympic committee stuck by its commitment to sustainability throughout the process. It can be easy to lose sight of those goals due to economics, but they did not waver."

The challenge came in the chemistry involved in meeting those standards. "The Cooley and Dow chemists worked on the project collaboratively for almost eight months, nearly full time," Dwight says. "We had Cooley chemists in Rhode Island, combined with Dow chemists in both Europe and the United States. They worked in separate research labs and then came together in our facility." Subsequently, the panels were mass-produced in Cooley's Lancaster, S.C., facility.

Dow turned to Rainier Industries, Seattle, Wash., to print and fabricate the innovative panels. Rainier was involved in both the 2002 Salt Lake City Winter Olympics and the 2010 Vancouver Winter Olympics. "This became one of those breakthrough jobs in so many ways," says Bruce Dickinson, Rainier vice president. "It broke new ground in terms of the fabric and manufacturing and in terms of the ability to combine color and print on the fabric. It really required a team to make it all happen."

As Cooley and Dow developed a new piece of material, it would be sent to Rainier for testing. Ultimately, the Rainier team found it could work with the heavier-base polyethylene fabric for the panels, and fabrication of the

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panels began in April 2012, Dickinson says. "It took 24 hours a day for 45 days to complete," he says.

Rainier printed the vibrant panels on Durst equipment using UV-curable inks (replacing conventional inks) to decrease emissions during the printing process and eliminate volatile organic compounds (VOCs). "Then we shipped 50 to 60 panels a week to London. Each panel weighed in at about 150 pounds," Dickinson says. To manage the fabric through the machines, Rainier had four sewing machine operators on each panel. "We had to really work with the printers to get adhesion onto the material," he says. "It was untested fabric, so an enormous amount of testing was involved."

Partnering success

Piccolrovazzi says of the extensive collaboration required by the three companies, "This partnership didn't just provide the wrap, we took the opportunity to leverage our knowledge and expertise to bring a 'first' to market."

"Fabric solutions are far less expensive than hard structure, and fabric can do a lot more as far as creating shape and movement," Dickinson says. "The future is bright for fabric applications."

This breakthrough product, comprised of Cooley's engineered-fabric membrane coated with resins made by Dow's performance plastics division, made its debut on July 20, 2012, showcasing its durability, printability, fire retardancy and recyclability. The compound that coats the polyester fabric is based on the latest generation Dow elastomers. Dow says the coating technology contains highly efficient flame retardants and high-performance additive technologies (colorants, processing aids and stabilizers).

The resulting new-generation fabric is now an active part of Cooley's EnviroFlex® line, taking the global lead away from PVC to polyethylene. According to information shared by the companies, the wrap is 35 percent lighter than earlier materials and boasts a lower carbon footprint due to its improved manufacturing procedures that require fewer processes and chemicals.

"To see a product at the very heart of the Olympics and to understand what the team had gone through to get there was unbelievably gratifying," Dwight says, adding that the company is already in discussions related to the 2014 and 2016 Olympics.

The stadium's second life

To accommodate the opening and closing ceremonies and track and field events, the stadium was built to hold 80,000 people; however, going forward there isn't a need for a

PHOTOS BELOW

AN OLYMPIC-SIZED TASK

Rainier Industries Inc., Tukwila, Wash., was hired to fabricate the panels that wrapped the London Olympic Stadium. The task required 24-hour days for 45 days to complete and demanded strict sustainability standards. Photos: Rainier Industries.

THE WRAP

- Includes resins made by Dow's Performance Plastics Division and required fewer raw materials to manufacture
- Includes polyester fabric with low-density polyethylene coating
- Is 35 percent lighter and has a 20 percent lower carbon footprint than more conventional materials, according to Cooley Group
- UV-curable inks were used to reduce emissions during the printing process and eliminate VOCs



A STUNNING FINISH

After Dow, Cooley and Rainier had developed, manufactured, fabricated and printed the fabric product, FabriTec Structures, Costa Mesa, Calif., (a brand of USA Shade and Fabric Structures Inc./Shade Worldwide) was called in for the final design detailing and engineering of the panels around the stadium itself.

The company and its 52-member crew executed a level of precision and teamwork that would make any Olympic coach proud as the installation transformed the panels into visually stunning fabric architecture. The look of the stadium was transformed as it was dressed in splashes of color from the panels that encircled the structure. The panels also provided directional assistance for attendees—every sixth banner displayed the sections and aisles.

Here again, expertise and teamwork played critical roles. “We’ve collaborated with Rainier on several other projects,” says Bill Schmidt, vice president of project management for Dallas, Texas-based FabriTec Structures. “We have quite a bit of experience working overseas, so we came in as part of the final step and also supplied the steel components necessary to attach the 306 banners to the existing stadium.”

In terms of challenges, Schmidt affirmed that one of the major ones was the compressed installation schedule. “We also spent significant time working closely with LOCOG to coordinate our attachments to the existing structure,” he says. “There was a very short timeframe for all of that. There were also many revisions to the design, which caused us to at times switch gears on the fly.”

It all came down to being able to adapt as needed, Schmidt says. “We took our original schedule and basically cut it in half. We managed to get as many crews as possible, and we worked long hours seven days a week. Fortunately, one of our supervisors who had previously worked in the United States is now living in London and was able to source some very good labor.”

All in all, this project had a very distinct feeling to it, Schmidt says. “With this one, it wasn’t an isolated project, the excitement was all around us because we knew what it was leading up to. The collaboration piece was very impressive, from Dow to Cooley to Rainier to us. It was a great team to be part of.”



structure that large. As such, it was designed so that the top half of the stadium, which held approximately 55,000 people, could be removed and physically reassembled somewhere else in the U.K. The stadium remaining in the Olympic Park will then hold about 25,000 people and serve as a community athletic stadium as well as a science and medicine training center.

Dow announced after the conclusion of the closing ceremonies that it has partnered with U.K. building and development charity Article 25 and recycling company Axion Recycling to repurpose and recycle the entire stadium wrap. “All of the stadium wrap will either be recycled or reused,” says Dow’s Piccolrovazzi.

Two significant repurposing projects will involve reusing some of the panels in Uganda and Rio de Janeiro, Brazil, as shaded shelter solutions for at-risk children. “We developed a list of screening criteria for the repurposing initiative, and Article 25 engaged with us to find an opportunity,” she

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— NICOLETTA PICCOLROVAZZI, DOW CHEMICAL CO.

says. “This project, as a whole, truly was a global effort, and what better way to acknowledge that than by bringing some of the London spirit to another part of the world.”

Amy Orchard is a freelance writer and editor based in St. Paul, Minn. Turn to page 96 for contact information on sources used in this article.

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