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# Plastics Fabricating and Machining

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# Copolyester reaches new heights of style and design

PLASTICS  
FABRICATING  
& MACHINING

by Chad Frazier and Pam Taylor

**T**he magic of the holidays inspires the child in us all. For Stephen Stefanou, president and design director of Dallas-based Design Solutions, capturing this sense of magic through dramatic art installations is tradition.

Well known for his work developing monumental seasonal displays at sites including Rockefeller Center in New York, MGM Grand in Detroit and the Bellagio in Las Vegas, Stefanou used the Crystals™ high-end retail environment at CityCenter, Las Vegas, to unveil the Kinetic Twisters sculpture made possible with the help of Eastman Chemical Company.

Filling the vast, contemporary space of the Crystals' architecture required a sculptural design that complemented its environment. Combining Crystals' prestigious reputation for elegance and grandeur set the bar high for Design Solutions as it began bringing its larger-than-life design to reality.

"Since the Kinetic Twisters is a winter holiday installation, our goal was to create the singular emotional experience of being surrounded by awestruck wonder — just like a small child feels during the holidays," said Stefanou. "The design was inspired by an Italian chandelier, and we wanted to capture that beauty of art glass on a truly grand scale."



A 60-foot holiday tree made of Eastman Spectar™ suspended 30-feet from the floor in Gaylord National Hotel in Washington, D.C.

The Kinetic Twisters design includes 600 strips of sparkling red and silver material extending as far as 60 feet from the ceiling, twisting and moving with airflow in the cavernous Crystals environment. The desired result for shoppers equates to being enveloped in ribbons on Christmas morning.

### **Material specification trial and error**

Creating the Kinetic Twisters required astute planning and extensive material experimentation. Given the unique artistry of the sculpture and required criteria for material selection, several design concepts satisfying a variety of objectives and budget constraints were developed and modified to meet the desired outcome. Design Solutions underwent three and a half years of material trialing, as well as 67 design renderings prior to the project's completion. In addition, seven architects and 13 interior designers assisted throughout the design and execution process.

From the onset, Stefanou recognized material selection was critical to success. In addition to the need for fire resistance, the material for the Kinetic Twisters had to be strong, lightweight and easy to fabricate.

Design Solutions trialed a variety of materials, including polycarbonate and acrylic. None of these materials consistently exhibited all of the required characteristics for the Twisters, including high molding temperatures, mold memory and overall stability.

After exhausting common material options, Stefanou and Design Solutions relied on its established relationship with Eastman, turning to the material supplier for assistance. With Eastman's help, Design Solutions selected a copolyester material to meet its design challenges — the same copolyester that was previously used in the holiday tree installation in the Gaylord National Hotel in Washington, D.C.



Six hundred strips of Eastman Spectar™ copolyester were heated and hand-shaped to a positive mold to give it the twister shape.

### **Designing with copolyester**

Working with the copolyester material proved to be a solution to several of Design Solutions' challenges, including complying with the National Fire Protection Association (NFPA) 286 flammability test



Design Solutions drew on the many advantages of Eastman Spectar™ to create a larger-than-life experience for shoppers at the Crystals in CityCenter, Las Vegas.

required by regional and national building codes. However, slight modifications still were required. For strength and safety, Design Solutions re-engineered the Kinetic Twisters' original design, making the upper panels from 1/4-inch sheet, while the lower panels were downgauged to a weight-saving 1/8-inch sheet. As a result of using copolyester, the sculpture's anticipated weight was reduced by nearly 2,000 pounds.

To achieve the 60-foot height required for this installation, 8-foot panels needed to be coupled with brackets without the concern of cracking or breaking. From past experience, Stefanou knew the copolyester material was tough enough to withstand drilling and clamping, enabling the complex design and fulfilling assembly requirements.

The ease of fabrication and design flexibility of the copolyester helped achieve the Kinetic Twisters' unique helix shape and glittery silver-on-red appearance, as well as the overall size of the installation. Each 8-foot panel was heated to 220°F/104°C) then hand-shaped by 12 individuals to a positive, computer-generated mold that gave it the twister shape.

After off-gassing for 24 hours, 25,000 feet of custom-embossed and printed opaque duplex red and silver film was manually applied diagonally in 5-inch strips. It was necessary for this process to occur after the molding process to avoid film deterioration due to heat exposure.

The final panels were assembled during a week-long installation process where Design Solutions' Kinetic Twisters were suspended from 37 star-shaped hangers.

### **Conclusion**

Despite years of searching for the perfect material to make its dream a reality, Design Solutions unveiled the Kinetic Twisters in the Crystals in Las Vegas' CityCenter in time for the 2010 holiday season. By selecting the proper material, Design Solutions ensured the beauty of its sculpture will last throughout the four month international winter holiday season.

"From the onset, I set out to make the Kinetic Twisters design as complicated and distinctive as possible by adding as much artistry and skill possible," Stefanou said. "From a design perspective, this whole process was as much about failure as it was about the success, and with the expertise and assistance provided by Eastman throughout, we were able to create a stunning reality out of our concept." ■

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*Photography credit: John Wadsworth Photography, courtesy of Design Solutions.*

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