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# SABIC Innovative Plastics helps GM's Advanced Design Studio create futuristic glazing for the EcoJet supercar

## Combining stunning aesthetics with environmental responsibility using lightweight Lexan* GLX resin

When talk-show host Jay Leno asked GM's Advanced Design Studio to create a mid-engine, turbine-powered supercar that would run on biodiesel, the designers knew they needed materials that were up to the challenge of this unique vehicle. Specifically, they required design freedom, high performance, exceptional aesthetics and environmental responsibility. The EcoJet supercar, which borrowed design influences from jet aircraft and Formula One racecars, demanded glazing components with a futuristic flair. At the same time, the windows, windshield and roofing panel had to enhance the overall intent to make the car environmentally progressive. To achieve all these objectives, the design team selected Lexan GLX resin from SABIC Innovative Plastics.

### Challenge

**Reducing glazing weight for improved fuel economy and stability**

An automotive enthusiast and collector of more than 100 vehicles, "Tonight Show" host Jay Leno turned to GM's Advanced Design Studio to see if racecar-like performance and muscular design could be combined with "green" principles such as ultra-light weight and alternative fuels. Accepting the challenge, the studio sought materials that would enable aggressive styling while adhering to environmental goals such as reduction of emissions and improved fuel efficiency. The project, dubbed the EcoJet supercar, tapped many different technologies – such as a shell constructed of carbon fiber over Kevlar – that combine extreme performance and futuristic styling with environmental responsibility. One of these technologies was next-generation glazing.

To avoid the weight disadvantages and styling limitations of glass, the designers looked for an alternative glazing material that could provide light weight, impact resistance for security and safety and exceptional clarity. The material also had to offer greater creative freedom than traditional glass. Specifically, the windscreen featured a severely raked design, with aggressive pillar curvature difficult to achieve with glass, and the turbine engine can be viewed through a large, distinctively shaped roof panel.

"We recognized immediately that glass could not deliver on all the different requirements of the EcoJet glazing," said Frank Saucedo, Director of Advanced Design, General Motors Design. "The extreme shapes we needed, plus the light weight required to minimize fuel consumption and avoid top-heaviness, mandated a high-performance thermoplastic. Lexan resin has established a top reputation in the auto industry for design versatility and exceptional performance. When we learned about the GLX resin family of Lexan materials, we signed up."

### Solution

**Lexan GLX resin glazing system gives a green light to breathtaking automotive design**

SABIC Innovative Plastics' Lexan GLX polycarbonate (PC) resin coated with Exatec® 900 glazing allowed GM's Advanced Design Studio to create sleek yet durable glazing elements for the EcoJet, including windscreen, side windows and roof panel. This highly weatherable, lightweight glazing solution combines Lexan GLX PC resin with the

Exatec® coating for resistance to abrasion and chemicals. This advanced glazing solution enables visual excitement with innovative finishes, functional integration of molded-in features and unprecedented design flexibility vs. glass for demanding automotive OEMs looking to incorporate high-performance functionality, optical quality and aesthetics into automotive windows.

Lexan GLX PC resin with Exatec 900 coating was chosen over more traditional competitive materials for the EcoJet because of its ease of manufacturing, scratch resistance, and high surface quality. In addition, the rear cover panel could not have processed with tempered glass methods due to the aggressive pattern.

## Benefits

### Weight reduction of 50 percent for improved fuel economy

Using Lexan GLX resin instead of glass enabled a weight savings of about 50 percent for better fuel economy. The American Plastics Council reports that for each 10 percent reduction in vehicle weight, mileage increases by seven percent.

Other benefits of Lexan GLX resin include

- Less roof weight to avoid top-heaviness. Reducing weight in a typical roof system can help lower the center of gravity, enhancing the EcoJet's ability to hug the road
- Shatter resistance for safety. Lexan GLX resin offers improved shatter resistance, potentially helping reduce risk of injury
- Toughness for intrusion resistance. An exceptionally tough material, Lexan GLX resin helps resist break-ins
- Design flexibility. Compared with glass and other materials, Lexan GLX resin offers greater freedom to create innovative designs. Further, this material from SABIC Innovative Plastics lends itself to part consolidation for cost savings
- Clarity. Lexan GLX resin is crystal-clear, giving vehicle occupants an unimpeded view of the road

"We are proud to be part of the design team that created the new 650 horsepower EcoJet vehicle," said Derek Buckmaster, Market Director, Exterior Body & Glazing for SABIC Innovative Plastics. "Through our environmentally progressive portfolio of products, SABIC Innovative Plastics is focused on developing materials that can enable OEMs, suppliers and designers to improve eco performance without impacting other important aspects of a vehicle, such as durability, safety and design creativity. Our materials together with Exatec's glazing technology are being used in all types of vehicles – from family sedans to the most futuristic concepts – because it helps meet the requirements of today's auto industry."

## For further information

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