SPE AUTOMOTIVE 43rd-Annual INNOVATION AWARDS COMPETITION & GALA
HONORING THE BEST IN AUTOMOTIVE PLASTICS

Process / Assembly / Enabling Technologies

Pressure Press Technology

OEM/Vehicle

General Motors Co.

2014 Corvette Stingray sports car

System Supplier

Globe Machine Manufacturing Co.

Material Processor

Plasan Carbon Composites

Material Supplier

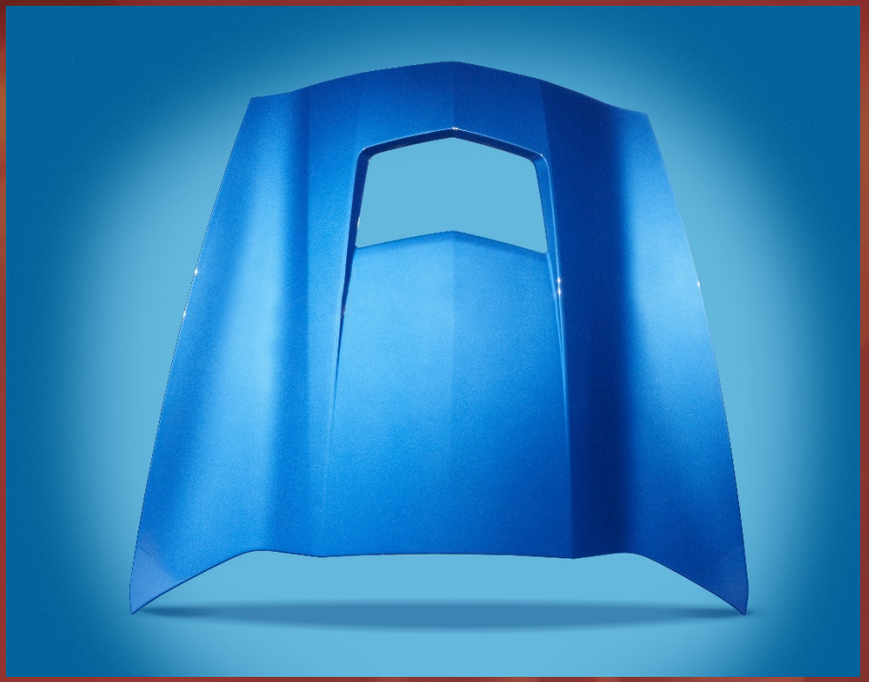
Toray North America

Resin

Toray Epoxy

Tooling/Equipment Supplier

Weber Manufacturing Technologies Inc.



This is the first production use of a new rapid out-of-autoclave production process for carbon fiber-reinforced composites. It produces parts with comparable mechanical properties and better aesthetics (requiring less post-mold finishing) far faster than the traditional autoclave (in 17 vs. 150 min). This significantly reduces costs and makes carbon composites practical and affordable for the first time for medium-volume production. Key to this significant technology breakthrough was R&D characterization of the autoclave cure cycle and resin curing dynamics, which led to several patent filings, a 66% reduction in cycle time, a 30% reduction in direct part costs, and a 75% reduction in the cost of process consumables. Additionally, thanks to rapid temperature ramp up and cool down, and isothermal processing, traditional exothermic cure reaction is avoided, eliminating the need for nitrogen blanketing and release of volatiles. The specially designed pressure press controls the process. Nickel-vapor-deposition (NVD) tooling with embedded hot-oil heating/cooling lines moves heat quickly through the Z-axis for rapid curing. A reusable silicone rubber canopy (good for 400-500 parts) replaces the cost and mess of traditional bagging supplies. Since parts exit with more consistent surfaces, 35% labor is reduced in finishing operations.