

# Arotran™ 770 Tough Low-mass Series Resins

## Now you can produce tougher, lower-density Class A SMC parts

The automotive industry is in a race to meet the National Highway Traffic Safety Administration's (NHTSA) recently augmented Corporate Average Fuel Economy (CAFE) standard requirements. While the goal of CAFE still is to reduce energy consumption by increasing the fuel economy of cars and light trucks, NHTSA's standards are designed to increase the CAFE levels rapidly over the next several years, so as to improve energy security and save consumers money at the pump. One approach automotive producers are taking to meet CAFE standards is to design and produce lighter vehicles. However, lower-density sheet molding compounds (SMC) introduced in the recent past did not provide sufficient strength and toughness while still maintaining Class A finishes required in exterior body panels.

Ashland's Arotran 770 Tough Low-mass (TLM) Series resins will help original equipment manufacturers' (OEM) engineers meet both regulatory and design parameters.

*According to the U.S. Department of Energy's Vehicle Technologies Office, a 10% reduction in vehicle weight can result in a 6% to 8% fuel-economy improvement.*

## Driving to Solutions

Ashland took a customer-driven approach when developing Arotran 770 Series resins. Before going into the lab, Ashland spent countless hours listening to customers to truly understand their perspectives regarding the current status of the automotive industry, existing issues and problems, and their visions of an ideal state. After this extensive research was completed, Ashland began working to find a solution that would substantially improve the physical properties, or 'toughness,' of Class A 1.2 density SMC, while maintaining surface quality and retaining ease of processing.

Ashland explored several approaches and studied the measurements derived using advanced laser surface analysis (ALSA) to determine surface-quality impact. Replacing the unsaturated polyester resin (UPR) being used in the current system with a vinyl ester resin (VER) that was selected based on the right combination of molecular structure and weight emerged as the ideal solution. Employing a 50:50 blend of UPR and VER, the surface quality did not degrade and the physical properties were significantly improved.

Arotran 770 Series resins are valuable in the automotive industry's search for long-term solutions to meeting the CAFE standards.

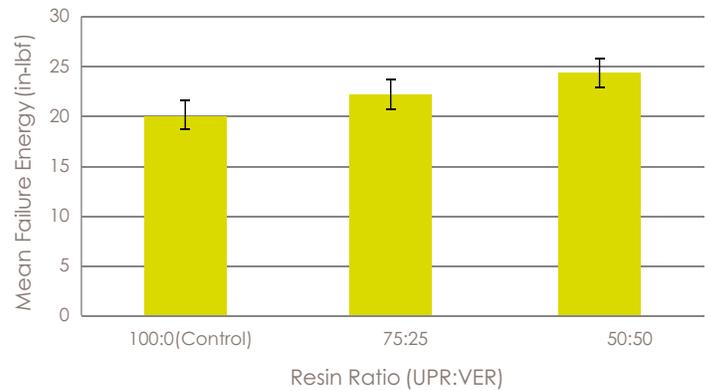
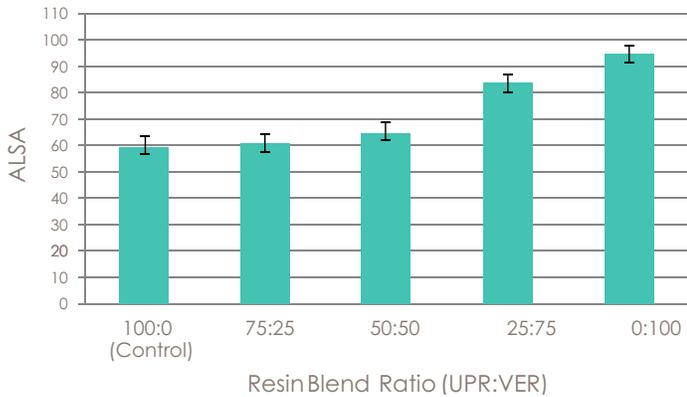
## Benefits

- Lowest density on the market at 1.2 density
- Surface quality equal to a Class A material
- Significantly improved toughness with higher physical properties compared to existing technologies, including:
  - Up to a 40% increase in flex and tensile strength
  - Up to a 20% increase in modulus and elongation
- Increased substrate adhesion and impact resistance



**Up to 50wt% of the UPR-based resin can be replaced with VER without degrading surface quality**

**50wt% VER increases impact resistance by an estimated 20%**



Worldwide resources dedicated to helping the automotive industry design and manufacture the cars of tomorrow.

From door panels to deck lids and valve covers to heat shields, Ashland's products and technical abilities help manufacture or increase the efficiency of almost any part of the vehicle. While primary research and development activities are based in the United States, we also maintain product development teams in Asia and Europe to ensure we develop solutions suited to our global customer base.

Ashland's technical service team has an industry-leading reputation for solving problems. We will work closely with our customers to understand specific application challenges and recommend the best product to meet business objectives. Whether focused on product design, process optimization or new product development, Ashland prides itself on building partnerships that lead to innovative solutions. Visit [ashland.com/transportation](http://ashland.com/transportation) to learn more.

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