

AROTRAN™ 770

TOUGH LOW-MASS SERIES RESINS

INEOS Composites not only understands the challenges the automotive industry is facing, we feel a responsibility to help you meet them. With a collaborative approach to problem solving and industry-leading technical support, we can find the answers that meet your unique needs. Together.

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. The goal of CAFE is to reduce energy consumption by increasing the fuel economy of cars and light trucks. Looking forward, 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 manufacturers 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.

Enter INEOS Composites' Arotran™ 770 tough low-mass (TLM) series resins. Designed to help original equipment manufacturers' (OEM) engineers meet both regulatory and design parameters, Arotran™ 770 delivers on both fronts.

Driving to Solutions

INEOS took a customer-driven approach when developing Arotran™ 770 series resins. Before going into the lab, INEOS 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, INEOS 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.

INEOS explored several approaches and studied the measurements derived using advanced laser surface analysis (ALSA) to determine surface quality impact. Replacing a portion of 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.

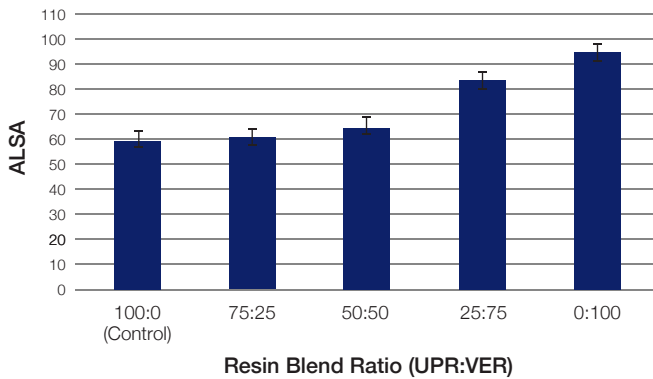
Arotran™ 770 series resins are valuable in the automotive industry's search for long term solutions to meeting the CAFE standards.

Benefits

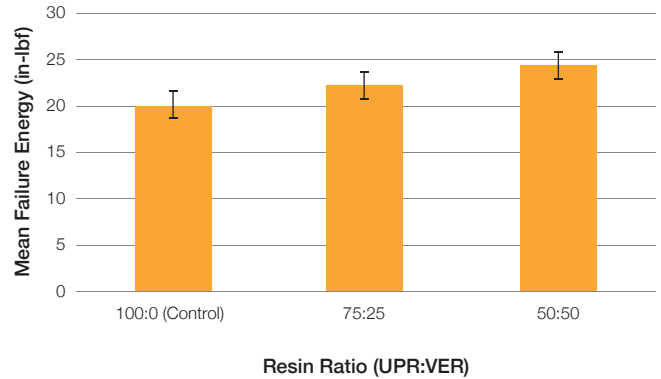
- Lowest density on the market at 1.2 density
- Surface quality equal to a Class A material
- Significantly improved toughness with higher physical properties compared to existing technologies, including:
 - Up to a 40% increase in flex and tensile strength
 - Up to a 20% increase in modulus and elongation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

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

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, INEOS' products and technical abilities help 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.

INEOS' 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, INEOS prides itself on building partnerships that lead to innovative solutions. Visit ineos.com/composites to learn more.

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