Driving Composites In The Transportation Industry

- Automotive
- Heavy Truck
- Hybrid Vehicles
- Electric Vehicles (EV)
- New Energy Vehicles

SMC • STC® • BMC
In the automotive and heavy truck market, designers are challenged to meet many different and sometimes conflicting requirements. Parts must have the physical properties to handle the loads and environments of demanding vehicle applications. At the same time, they must be relatively lightweight, cost effective, and manufacturable in the time allowed by tight production schedules. In some cases, they must also have a pleasing appearance that will help attract buyers and differentiate a vehicle from its competitors.

A large and growing number of automotive and heavy truck designers are discovering the advantages of converting to thermoset composite materials. Consisting of fiber reinforcement in a polymer resin, thermoset materials such as bulk molding compound (BMC), sheet molding compound (SMC) and a new line of Structural Thermoset Composites (STC®) used for a wide range of automotive and truck parts, including exterior body panels, headlamp and tail light housings, interior structural and cosmetic components, and under-the-hood electrical and heat-shielding components.

Design engineers in the automotive and heavy truck industry face considerable challenges in controlling costs while retaining physical properties needed in high-performance applications.

Features of BMC, SMC and STC® that make them ideal for the transportation industry:
- Light weight
- High thermal stability
- Excellent impact resistance
- Aesthetic surfaces

Ultrim™ Structural Thermoset Composites are a series of materials that raise the bar on stiffness as a function of weight to a level beyond that of Fortium™ STC®. The carbon fiber reinforcement of Ultrim™ STC® makes these products well suited for complex geometric applications that require performance optimized high stiffness and low weight.

The ability to tailor the resin system (vinyl ester/urethane and epoxy are just two of the possible options) with carbon fiber provides application designers with the compatibility necessary to marry the Ultrim™ STC® with carbon pre-pregs. This multi-material solution provides engineers with the high strength to weight ratios they have come to expect with a composite solution with the desire and need to push design geometries to the next level.
Composite Solutions For The Transportation Industry

Manufacturers require materials that can withstand years of abuse without losing the physical properties needed to maintain proper performance. High temperatures, corrosive substances, and structural demands are a few of the ways these materials are stressed during normal use. Yet, they are expected to last for the projected life cycle of the vehicle, which can often be measured in decades rather than years.

The unique physical properties of thermoset composite bulk molding compound (BMC), sheet molding compound (SMC) and a new line of Structural Thermoset Composites (STC®) make it the perfect alternative to die-cast metals for these applications.

Thermosets have a high strength-to-weight ratio and an excellent NVH (Noise Vibration Harshness) rating, making them effective in dampening normal harmonic vibration. Many design engineers are discovering the advantages of switching to thermoset composites for both under-the-hood and high visibility aesthetic applications.

Flamevex™ materials are ideal for applications which require high fire resistance and high mechanical performance while also reducing weight and maintaining dimensional stability. Flamevex™ materials can be used for parts that must meet a range of fire resistance levels, from UL 94 V0 and 5VA to the stringent Chinese Standard G/BT 31467.3 tests (aka Chinese Bonfire testing).

IDI’s Flamevex™ series is especially well-suited for applications in the electric vehicle and new energy vehicle market. Ideal for applications such as an EV battery cover, Flamevex™ materials are highly flame-resistant SMCs with high mechanical properties and a low level of shrinkage, offering the ability to mold complex parts with dimensional stability for a lightweight solution.
IDI Composites International (IDI) is the premier global custom formulator and manufacturer of thermoset molding composites and compounds for OEMs, Tier 1s and molders. The company provides customized polyester/vinyl ester-based bulk molding compounds (BMC), sheet molding compounds (SMC), and a new line of Structural Thermoset Composites (STC® - Ultra Performance Moldable Composites) that are manufactured in both sheet and bulk formats for the most demanding applications.