Lightweighting vehicles through composites technologies

IACMI – The Composites Institute calls Michigan home through core partners Michigan State University (MSU) and the Michigan Economic Development Corporation (MEDC).

More than 75% of all the U.S.'s automotive R&D occurs in Michigan. A focal point of research and development in this area are composites technologies that offer both significant weight savings and high-volume manufacturing.

Facility Hosts and Partners

Michigan State University has three composites centers – the Composites Materials and Structure Center and the Composite Vehicle Research Center on main campus (E. Lansing) as well as the Scale-up Research Facility (SuRF) in Detroit. The SuRF's unique position in the United States composites ecosystem is to develop and scale emerging composites materials and manufacturing technologies, prototype multi-functional composite components at full-scale, and demonstrate at high-volume cycle times. The SuRF is an integral asset to the evolving future mobility ecosystem in the City of Detroit (Corktown neighborhood).

Companies that have been involved in projects at the SuRF include VW, Ford, General Motors, BASF, Dow, Teijin Automotive. Equipment partners have included Litzler, Milacron, Schuler, and Fill.

Research Features

Key Equipment and Technology:

- Integrated molding cell with:
  - High-pressure resin transfer molding/liquid compression molding system
  - 4,000-ton compression molding cell
- Automated tape laying (ATL) machine
- 3,000-ton injection molding/overmolding cell
- Prepreg line for novel prepreg material production
- Rapid heat-cool system
- Plasma treatment
- Compounding
- Prepreg slitting, chopping, and laminating equipment

Recent projects:

- OEM-qualified epoxy resin system for high-volume automated manufacturing applications
- Injection molding with low-cost textile-grade carbon fiber
- Design and manufacture of lightweight composite liftgate including parts consolidation

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