Volkswagen Atlas liftgate:
Reducing weight and cost through lightweight body panels

Because of its innovation advancements made through an IACMI technical project, Volkswagen opened its Innovation Lab at the University of Tennessee's Cherokee Farm in 2020. IACMI supported VW in its echnical project leading to the development of a composite liftgate for the Volkswagen Atlas, and the Innovation Lab is one of the only in the U.S.

CHALLENGE

Incorporate part into vehicle that has:

- Lighter weight than conventional parts
- Less susceptibility to corrosion
- Class A finish and is less likely than steel to show damage from minor impacts

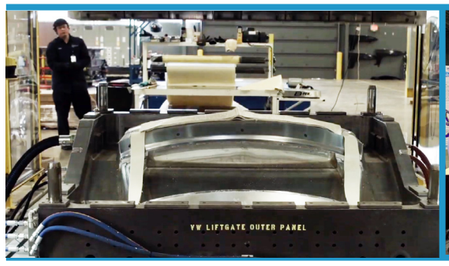
APPROACH

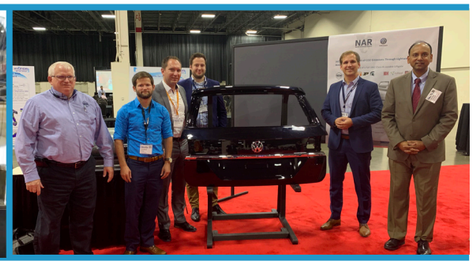
- Collaboration led by IACMI and
- Volkswagen between academic
- research institutions and industry partners to integrate novel material into liftgate

PROJECT PARTNERS

RESULTS

- 35%+ reduction in weight from comparable steel part
- Parts consolidation in liftgate
- Cost competitive with comparable aluminum part
- Composite solution provides aesthetic, strength, and performace characteristics demanded by industry standards





IACMI – The Composites Institute
www.iacmi.org
2360 Cherahala Blvd.
Knoxville, TN 27932

University, State, Regional, National Laboratory, & Association Partners

The Institute for Advanced Composites Manufacturing Innovation (IACMI), managed by the Collaborative Composite Solutions Corporation (CCS). CCS is a not-for-profit organization established by the University of Tennessee Research Foundation. As a Manufacturing USA institute, IACMI is supported the U.S. Department of Energy's Advanced Manufacturing Office in the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE).

IACMI – The Composites Institute®

Institute Outcomes in Michigan

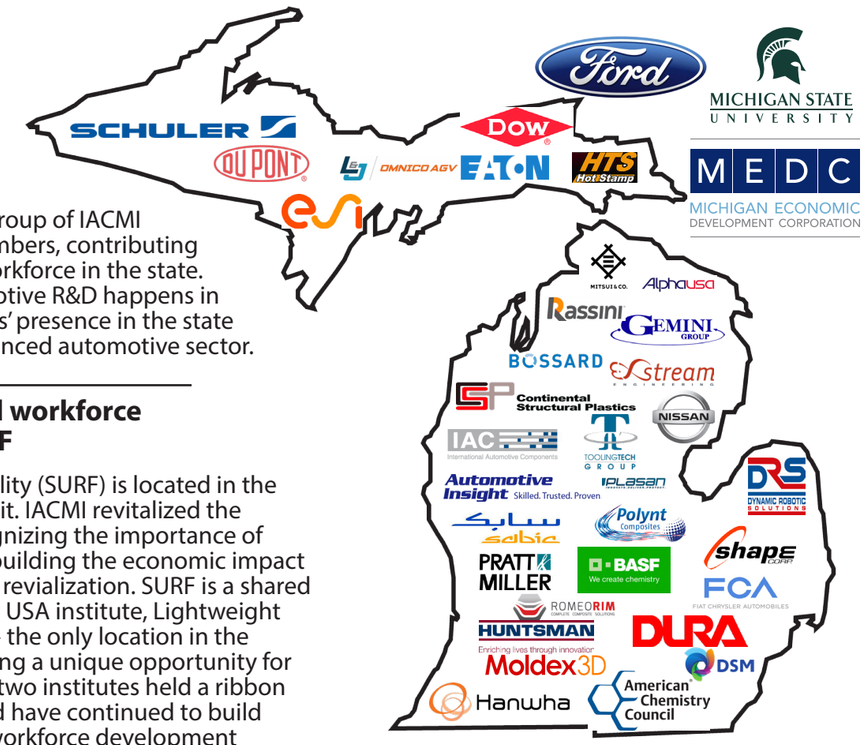
March 2020

Building an innovation network in Michigan

Michigan is home to the largest group of IACMI members, with more than 30 members, contributing to the growing manufacturing workforce in the state. Seventy-five percent of all automotive R&D happens in Michigan, making IACMI members' presence in the state impactful in the increasingly advanced automotive sector.

Connecting innovation and workforce development at IACMI SURF

The IACMI Scale-Up Research Facility (SURF) is located in the Corktown neighborhood in Detroit. IACMI revitalized the building beginning in 2015, recognizing the importance of investing in the community and building the economic impact on the front-end of the Corktown revialization. SURF is a shared facility with fellow Manufacturing USA institute, Lightweight Innovations for Tomorrow (LIFT) – the only location in the U.S. to house two institutes, offering a unique opportunity for multi-material collaboration. The two institutes held a ribbon cutting on the facility in 2017, and have continued to build the technical advancement and workforce development resources since.



IACMI Members in Michigan

About IACMI

IACMI – The Composites Institute is a 160+ member community of industry, academia, and government agencies leading innovation and workforce development initiatives to drive the adoption of advanced composites to grow U.S. manufacturing and support national security. IACMI, a Manufacturing USA institute, is supported by the U.S. Department of Energy's Advanced Manufacturing Office, as well as key state and industry partners.

Advanced composites provide strength and stiffness while being very lightweight. These characteristics provide advantages in many transportation, energy, and inrastructure applications. Greater deployment of advanced composites can offer benefits, such as providing safer, more energy-efficient vehicles. IACMI is working to drive the large-scale adoption of advanced composites in diverse markets.

IACMI – The Composites Institute creates an **ecosystem of innovation** to drive **commercial outcomes** that lead to **economic growth**.

Creating an Innovation Network

8 Current IACMI technical projects with innovations created in MIchigan

10 Michigan companies participating on current IACMI technical projects

Support for IACMI in Michigan provided by MICHIGAN STATE UNIVERSITY, planetM MICHIGAN ECONOMIC DEVELOPMENT CORPORATION

"IACMI and LIFT show how partnership and inclusive ingenuity drive innovation in Detroit. Thank you for showing me your training, prototyping, and education programs that create opportunities for vets, K – 12 students, and Corktown." - Lt. Governor Gilchrist, Feb. 2019

Forbes **Michigan's New Governor Can Accelerate the Auto Industry's Transformation**

"The industry is on the cusp of a light-weighting and multi-material revolution. Detroit hosts two public-private partnerships under the Manufacturing USA initiative that could, with the right direction, be the epicenter of many industry lightweight innovations." – Forbes, Nov. 13, 2018

"How do we build the broadest network possible and help to be that coordinator to bring people together across the world – and to do this in the most responsible fashion?... We're helping lead in advanced materials. All you have to do is go to Rosa Parks and find the two best places for advanced materials in the United States: IACMI and LIFT." - Former Gov. Snyder, Plug and Play Summit

Through their IACMI partnerships, JEC, ACMA, and CompositesWorld contributed to the JEC Composites Pavilion at the 2019 North American International Auto Show (NAIAS) to provide additional composites-related media and visitors to the pavilion, garnering a broad reach and impactful presence at the first NAIAS composites pavilion.

Establishing an Environment for Innovation

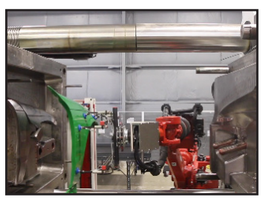
The IACMI SURF is a full-scale, production-relevant facility for innovation in the heart of industry in Detroit, MI. SURF is managed and operated by Michigan State University, and is home to essential manufacturing equipment that allows industry to research, design, and test cost-savings processes and new materials to integrate into their own production lines in a separate space, without interrupting production lines.

Equipment at SURF

- Schuler 4,000-ton compression molding cell
- Milacron 3,000-ton injection molding cell
- Litzler prepreg line
- Hennecke high-pressure RTM system
- RocTool rapid heat-cool system
- Plasmatreat
- Compounding line
- Prepreg slitting, chopping, and laminating equipment series
- Industry engagement spaces

Innovations through Michigan-based research

The Dow composite material, developed through a prominent IACMI technical project, achieved part level material performance such that Ford is willing to declare it acceptable for specification on future vehicle platforms.



IACMI members created the first large injection molded automotive prototype made with low-cost textile grade carbon fiber. Textile carbon fiber has an estimated reduced cost of 40 – 50% compared to its traditional 50,000 filament tow commercial counterpart.

Commercially available products developed through IACMI collaborations:

DOW®

Saving cost through rapid curing:
Dow VORAFUSE™ P6300
Dow VORAFUSE™ M6400

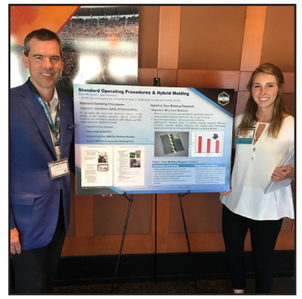
Serving Workforce Needs

15 Michigan Internship placements

300+ K – 12 STEM participants in Michigan

460+ Composites training workshop participants in Michigan, in partnership with Composites One and CompositesWorld

2,000+ Visitors to SURF



"One of my projects was to create Standard Operating Procedures (SOP's) for a Litzler Prepreg Line... at the Summer Members Meeting I got to meet Matt Litzler, the man who designed IACMI SURF's Litzler Prepreg Line. Thank you, IACMI, for providing me with such tremendous opportunities!"
– Eliza Michaud, 2018 IACMI Intern at SURF

Workforce development events in Michigan include:

- Composites technician training workshops, open to the community and free of charge, hosted with Composites One
- Company-specific training workshops
- Compression molding workshops with CompositesWorld
- Manufacturing Day K – 12 STEM events
- Internship hands-on learning opportunities
- Conference presentations
- American Composites Manufacturing Association Tech Day participation

Impacting Economic Development

National composites industry impact:

$400M Investment in eight states

3,000 Jobs announced

Members Meetings hosted in Michigan:

IACMI hosted its Winter 2016 and Winter 2018 Members Meetings in Michigan, bringing more than 300 attendees from across the country to Detroit for each meeting.