

IACMI showcased Indiana member innovations at the 2018 International Manufacturing Technology Show (IMTS) through the collaborative “Die in a Day” project. “Die in a Day” allowed show visitors the opportunity to follow the journey of an additively manufactured metal die as it is 3D printed, machined, and used to mold advanced composite parts – all in only a few hours on the exhibit floor.



The 2018 IMTS was the 32nd edition of the show, and drew a record registration of 129,145 attendees, featuring 1,424,232 square-foot of exhibit space in Chicago’s McCormick Place. IMTS focuses on showcasing significant advancements in materials and speeds for additive manufacturing. The collaborative nature of IACMI’s ecosystem presents the advantages of pre-competitive collaboration to drive industry-wide innovations.

“Die in a Day” project partners include:



# IACMI – The Composites Institute®

## Institute Outcomes in Indiana

April 2019



### Indiana – Driving Technology-driven manufacturing

Indiana is home to Purdue University, which leads IACMI’s design, modeling, and simulation (DMS) capabilities. These best-in-class resources offer essential research, development, and educational opportunities for industry to quantify cost-saving processes, materials, and best practices when introducing new practices into manufacturing. As the U.S. manufacturing sector continues to grow, world-renowned DMS proficiencies become even more essential. Purdue University’s IACMI-supported Composites Manufacturing Simulation Center (CMSC) leads essential and innovative industry growth catalysts through world-renowned researchers and capabilities.

### Building an innovation network in Indiana

- > **1 in 5** Hoosiers jobs are supported by manufacturing
- > **1/3** of the 8,500 manufacturers in Indiana are advanced manufacturers
- > **25%** of Indiana economic output is based in manufacturing
- > **\$36.6B** in manufactured good exports (2017)
- > **108,100** manufacturing jobs since 2009
- > **#2** in the nation for manufacturing jobs added since 2009

Source: Indiana Economic Development Corporation



IACMI Members in Indiana



### 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).

### 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 infrastructure 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 Indiana

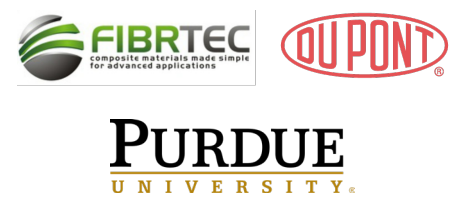


**Supporting collaboration spaces for technology-driven manufacturing**



In January 2019, IACMI; Purdue University; Jim Schellinger, Indiana Secretary of Commerce; as well as Indiana Economic Development Corporation (IEDC) representatives cut the ribbon on the Manufacturing Design Laboratory at Purdue University's Indiana Manufacturing Institute (IMI), which is supported by IACMI. The Manufacturing Design Laboratory is a research space dedicated to the technology-driven, digital future of manufacturing.

**Leading technology projects to save industry cost**



In May 2018, a team from DuPont, Fibrtec, and Purdue University completed the first phase of an IACMI technical project to create a new carbon fiber composite manufacturing process that would provide better fabric formability characteristics. This process reduces waste by relying on near-net shaping formations to eliminate wasted carbon fiber material, reducing the manufacturing cost for industry.

**Commercial outcomes:** DuPont Rapid Fabric Formation technology validated | Fibrtec FiberFlex technology validated

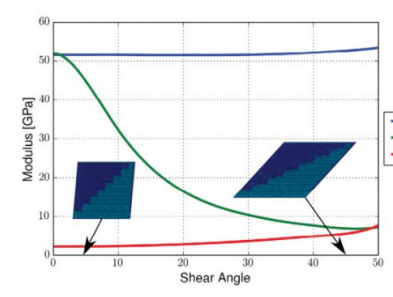
**Establishing an Environment for Innovation**

**Creating space for industry collaboration in design, modeling, and simulation**



The Indiana Manufacturing Institute (IMI), a 62,000-square-foot facility which is part of the Purdue Research Park of West Lafayette, is home to the Center for Composites Manufacturing and Simulation Center (CMSC). The IMI allows industry and academic researchers to collaborate on innovations impacting technology-driven manufacturing. With a concentration on design, modeling, and simulation, insight gained through world-renowned CMSC researchers and software capabilities can provide significant cost-saving advantages for industry partners engaging in the center.

**Accelerating market advancements through reduced risk in manufacturing and materials understanding**



"With improved composite simulation, engineers can successfully complete more designs with less need for physical model trials. This can accelerate time to market and reduce overall costs to produce a new design or part." – Digital Engineering Sept. 2018, referring to the importance of Purdue University

simulation capabilities as part of IACMI projects

**Purdue University hosts American Society for Composites 32<sup>nd</sup> Technical Conference**

This 2017 conference at the IMI welcomed 400+ attendees, with 35% students & 35% non-university attendees. There were 6 plenary sessions including 250 parallel talks.



**Serving Workforce Needs**

**6** Indiana Internship placements  
**1700+** K – 12 STEM participants in Indiana  
**120+** Composites training workshop participants in Indiana, in partnership with Composites One

**Workforce development events in Indiana include:**

- Composites technician training workshops, open to the community and free of charge, hosted with Composites One
- Manufacturing Day K – 12 STEM events
- Internship hands-on learning opportunities
- Conference presentations

**Annual Dassault Systèmes sponsored internships at Purdue University**

IACMI Charter Member, Dassault Systèmes fully funds six long-term interns hosted at the Indiana Manufacturing Institute at Purdue University. The students have the opportunity to work on projects with composites design and simulation experts and industry partners.



"The IACMI internship incorporates government, industry, and academia all into one opportunity. Any other internship you apply for, you're not going to get that." – Jessica Lavorata, 2017 IACMI Intern, 2018 Purdue Graduate Student

**Impacting Economic Development**

**National composites industry impact:**

**\$400M** Investment announced in eight states  
**3,000** Jobs announced

**Members Meetings hosted in Indiana:**

IACMI hosted its Summer 2016 and Winter 2019 Members Meetings in Indiana, bringing more than 300 attendees from across the country to Indianapolis for each meeting.