

THE EVOLUTION OF COMPOSITES

Process & Product Efficiencies for Today and Tomorrow

March 20 - 21 • Vanderbilt University • Nashville, TN

Composites One and the Closed Mold Alliance, in partnership with IACMI - the Composites Institute, invite you to attend The Evolution of Composites: Process & Product Efficiencies for Today and Tomorrow hosted at Vanderbilt University's Laboratory for Systems Integrity & Reliability (LASIR), March 20 - 21, 2019.

Location:

Laboratory for Systems Integrity & Reliability (LASIR)
566 Mainstream Drive Ste 700
Nashville, TN 37228

Workshop Hours:

Wednesday, March 20: 2:00 p.m. - 5:00 p.m.
Thursday, March 21: 8:00 a.m. - 4:00 p.m.

Networking Reception:

Join us for a networking reception and supper-by-the-bite on Wednesday, March 20
from 6:00 p.m. - 9:00 p.m at Saltine.

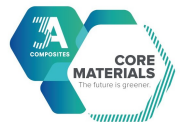
Register Today at: www.iacmi.org/evolution-of-composites

Sponsored By:

LASIR Laboratory for Systems
Integrity & Reliability

VANDERBILT  SCHOOL OF ENGINEERING

VECTORPLY
PERFORMANCE COMPOSITE REINFORCEMENTS



PRO-SET



 **SOLVAY**

RTM
North
LTD.

ARKEMA
INNOVATIVE CHEMISTRY

CHOMARAT

 **Axson**

BUILDING TRUST



 **Chem
Trend**
Release Innovation™

Presented By:



**ClosedMold
Alliance**
Composites One • MVP
RTM North Technologies




MVP
MAGNUM VENUS PRODUCTS

- 2:00 p.m. Welcome Remarks**
Walt Beaver, Vice President of Sales - East, Composites One
Douglas E. Adams, PhD, Distinguished Professor and Chair, Vanderbilt University
- 2:10 p.m. Agenda Preview**
James Jones, Technical Support Manager, Composites One
- 2:15 p.m. Rapid Mold Construction Process**
Sika Advanced Resins' innovative epoxy tooling system allows rapid mold development by utilizing an epoxy core material. The mold surface and structure can be molded quickly, resulting in a robust tool face with minimal time and effort. This session will demonstrate the advantages of Sika's advanced tooling system.
Presented By: Jason Cilio, Key Accounts Manager, Sika Advanced Resins
- 3:00 p.m. High-Temperature Tooling - Infused Carbon Fiber / Epoxy Mold**
Vacuum infusion processing (VIP) is increasingly utilized for the production of elevated temperature tooling due to the associated cost and labor reductions. This demonstration will showcase the production of a carbon fiber / epoxy mold using Vectorply's VectorUltra C-4QX 9400 quadraxial carbon fiber tooling fabric and Pro-set's HTP 182/284 High-Temp Epoxy.
Presented By: Will Chafin, Advanced Composites Applications Specialist, Composites One, Mike Ditzler, Field Engineer, Vectorply; and Jeff Wright, VP of Technical Services, Pro-Set
- 3:30 p.m. Break - Stop and Visit Our Vendor Tables!**
- 3:45 p.m. 3D Printing with Composite Materials**
Owens Corning will demonstrate 3D printing parts using XStrand GF30-PP and GF30-PA6.
Presented By: Ross Cunningham, Ph.D., Advanced Scientist, Front End Innovation Business Development, XStrand 3D Composites Materials, Owens Corning and Adam Davis, Additive Manufacturing Engineer, Owens Corning Front End Innovation
- 4:05 p.m. BAAM Technologies: Thermoplastic, Thermoset, Surface Coatings**
Big Area Additive Manufacturing (BAAM) has evolved into a viable technology for constructing parts and tooling. A variety of materials are available that enable these processes to add tremendous value to new product development.
Presented By: Neil Smith, Technical Support Manager, Composites One; John Lindahl, Technical Professional in Polymer Additive Manufacturing and Advance Composites, Oak Ridge National Laboratory; John Miller, VP of Operations, Tru Design; and Dylan Talley, Staff Engineer, University of TN, Knoxville
- 5:00 p.m. Agenda Preview for Day Two and Closing Remarks**
James Jones, Technical Support Manager, Composites One
- 6:00 p.m. Networking Reception**
Join us for a networking reception and supper-by-the-bite on Wednesday, March 20, from 6:00 p.m. - 9:00 p.m at Saltine.
- Saltine**
1918 West End Ave
Nashville, TN 37203



Are You CCT Certified?

The Certified Composites Technician Program was created by ACMA in 1999 in response to the industry's clear need for uniform training and technical skills. CCT is the only certification program of its kind in the industry. The majority of CCTs are composites manufacturing employees. Program benefits for companies include: Increased productivity, lower production costs, enhanced product quality, improved plant safety, lower employee turnover and a more skilled, forward-looking workforce capable of promoting long-term market growth. ACMA members receive discounted rates on all CCT programs.

Learn more today at www.acmanet.org/cct.

-
- 7:30 a.m. Breakfast and Networking Hour**
Come early and enjoy breakfast while networking with our facilitators and vendors!
- 8:25 a.m. Opening Remarks**
Robin Pate, IACMI - The Composites Institute
- 8:30 a.m. Agenda Preview**
James Jones, Technical Support Manager, Composites One
- 8:35 a.m. Taking Sandwich Construction to The Next Level**
The evolution of composite materials and lamination is mutual and collaborative. Although sandwich construction is not new, advanced processes such as closed molding and new thermoplastic resin systems bring about both new core materials as well as development of long-standing materials. Learn about some new improvements to our AIREX®, BALTEK® and Lantor® products and see how they can contribute to new, advanced, lightweight laminate designs.
Presented By: Russell Elkin, Product Development Manager, 3A Composites
- 9:05 a.m. Closed Mold Processes: Side-by-Side Demo**
This demonstration will highlight the differences and applications of three common closed mold processes: 1) vacuum infusion processing (VIP); 2) reusable silicone bag infusion; and 3) light resin transfer molding (LRTM).
Presented By: James Jones, Technical Support Manager, Composites One; Neil Smith, Technical Support Manager, Composites One; Doug Smith, President, RTM North; Travis Irvin, Sales Manager, Chomorat; Rick Pauer, Applications Manager, Polynt; and Dan Gruenwald, Sales Representative; Magnum Venus Products
- 9:50 a.m. Process Monitoring**
The overarching goal of this IACMI Task 4.2 project is to demonstrate the commercial viability of manufacturing wind turbine blades from thermoplastic materials. Thermoplastic resins have potential to be lower cost than epoxy and reduce in-mold cycle time with increased infusion speeds due to very low viscosity resins and rapid polymerization kinetics. Vanderbilt's work in Task 4.2 has been focused on developing fast algorithms for estimating subsurface temperatures (in bulk) using full field surface temperature measurements as inputs to the fast algorithm.
Presented By: Chris Nash, Graduate Student, Vanderbilt University
- 10:05 a.m. Break - Stop and Visit Our Vendor Tables!**
- 10:20 a.m. Manufacturing of Repeatable Closed Mold Production Quality with Consistent Technician, Engineer and Management Process Implementations**
Overview of actionable process best practice, certification, and training programs to improve composite part production efficiency. Methods to implement cost reduction and effective use of labor and materials.
Presented By: Andrew Pokelwaldt, Director, Certifications, ACMA
- 10:40 a.m. Thermoplastic Wind Blade Project**
The wind turbine market is seeking materials that help reduce the levelized cost of energy (LCOE). These include lower cost materials, those that reduce manufacturing cycle time, improve durability in service, and/or enable end-of-life disposal. A group of government and industry partners recently collaborated on a project in which several innovative options were tested out during the manufacture of a thermoplastic blade.
Presented By: Dana Swan, Business Development Manager, Arkema
- 11:10 a.m. Low Cost Carbon**
IACMI members Techmer PM, Oak Ridge National Laboratory (ORNL), and Michigan State University (MSU) produced the first ever successful compounding and injection molding of a full-size automotive component using Nylon 66 (PA66) and textile-grade carbon fiber at IACMI SURF facility. This innovative production approach yields an estimated cost savings of 40 – 50% in carbon fiber manufacturing.
Presented By: Merlin Theodore, Director Carbon Fiber Technology Facility, CFTF at Oak Ridge
- 11:40 a.m. Rapid Build, Infused Tooling for Molds and Fixtures**
Controlled shrink molds and fixtures can easily be made using a low viscosity resin in an infusion process with non-crimp reinforcements to make tools produced and cured at ambient temperature. These molds and fixtures can be used to make open and closed mold thermoset parts, as well as for use in pre-preg processing up to 250F cure or in vacuum thermoforming processes up to 375F.
Presented By: Rick Pauer, Applications Manager, Polynt and Mike Ditzler, Field Engineer, Vectorply

- 12:00 p.m. Lunch - Please Visit Our Vendor Tables!**
- 12:45 p.m. Non-Destructive Evaluation**
 Surface temperatures of a curing composite part, infused with a thermoplastic resin, were monitored using an IR camera. The temperature data was used to develop an algorithm, based on the total energy lost to the environment from a pixel location, to locate potential manufacturing flaws in the composite part.
Presented By: Chris Nash, Graduate Student, Vanderbilt University
- 1:15 p.m. The Future is Water - New Mold Release Technology**
 Release agents are an integral part of many manufacturing processes. They are often necessary, but are not frequently understood for the value that they can add. Specialty release agents can enhance productivity, extend tool/die/mold life, increase cycle times, improve part/surface quality and reduce scrap and defect rates, just to name a few of the many potential benefits. This session will cover ChemTrend's newest technology, water based primers, sealers, and release agents.
Presented By: Russ Powers, Aerospace & Composites Industry Technical Manager, Chem-Trend
- 1:35 p.m. DForm - Deformable Rapid Forming Tooling System**
 DForm is a labor- and cost-saving tooling prepreg technology that combines the conformability of a short fiber molding compound with the directional characteristics of a high performance, long fiber composites. This demonstration will show the ease of lay-up of DForm tooling prepreg for constructing high temperature carbon fiber molds.
Presented By: Neil Smith, Technical Support Manager, Composites One and Will Chafin, Advanced Composites Applications Specialist, Composites One
- 2:10 p.m. C-Ply and Next Steps for Composites**
 Chomarat's C-Ply non-crimp carbon fiber reinforcements use the most advanced technology and tow spreading process to produce gap-free plies and optimized layer construction. This session will cover composites in the mainstream: past and future; and reduced part cost through preferred fiber angles and combined formats.
Presented By: Chris Mikesell, Sales Manager - Carbon, Chomarat and Travis Irvin, Sales Manager, Chomarat
- 2:40 p.m. Break - Stop and Visit Our Vendor Tables!**
- 2:55 p.m. Carbon Fiber Recycling - Problem Solved!**
 Carbon Fiber Recycling, Inc. has developed a process to recycle cured, uncured and prepreg carbon fiber. The company can recycle four million pounds per year out of their Tennessee facility starting in the next year. This talk will discuss their recycling process and capabilities, current projects, and long range plans.
Presented By: Tim Spahn, Director of Licensing & Sales, Carbon Fiber Recycling, Inc.
- 3:15 p.m. Putting it All Together with ProSet Adhesives**
 Pro-Set Epoxy pre-thickened adhesives provide high strength bonds to many substrates used in composite structures. This session will explain product selection, handling characteristics, properties, and proper application.
Presented By: Derek DeBoer, Midwest Regional Sales Manager, Pro-Set and Jeff Wright, Vice President of Technical Services, Pro-Set
- 3:35 p.m. Recycling**
 The growth of composites in major industries has necessitated the development of new material waste management strategies. This session highlights ORNL and IACMI led research into embodied energy of composite materials, life cycle assessments, methods of recovery, production for recycled fiber composites, and development of new potential commercial products.
Presented By: Komal Kooduvalli, The University of Tennessee and Ryan Ginder, Oak Ridge National Laboratory
- 4:00 p.m. Closing Remarks**
 James Jones, Technical Support Manager, Composites One