CAMX

THE COMPOSITES AND ADVANCED MATERIALS EXPO

September 26–29, 2016: Conference / September 27–29, 2016: Exhibits
Anaheim Convention Center / Anaheim, California

2016 POST-SHOW REPORT

COMBINED **STRENGTH**
UNSURPASSED **INNOVATION**

www.**theCAMX**.org

PRODUCED BY

ACMA SAMPE

OFFICIAL MEDIA PARTNER

CW CompositesWorld

CAMX 2016 Overview

20%
of attendees made CAMX 2016 their first CAMX

94%
of attendees made new connections at CAMX

99%
of attendees recommend CAMX

7,987
TOTAL ATTENDES

52
COUNTRIES REPRESENTED

CAMX 2016 was held September 26-29, 2016 in Anaheim, CA and proved to be the biggest and best attended North America composites event covering the advanced composites and FRP composites industries under one roof. **In its third year, CAMX grew in size with 10% more attendees and more exhibit space,** establishing itself as the largest global composites and advanced materials event in North America. Over 1,000 new attendees made CAMX 2016 their first CAMX.

CAMX – The Composites and Advanced Materials Expo – is the one source for connecting and advancing all aspects of the world's Composites and Advanced Materials communities: R&D, engineering, manufacturing, service providers and end-users. **Regardless of the application – transportation, aerospace, marine, wind energy, software, construction and infrastructure, medical, academics, sports and leisure – CAMX is America's go-to event in the U.S. for the global composites and advanced materials communities**. It provides a venue for companies and individuals to grow business opportunities, develop industry skills, understand their potential impact on the industry and new markets, and showcase new innovations in products and technology. CAMX is jointly owned and produced by ACMA and SAMPE.

Event Highlights

- 544 Exhibitors
- 9 Unopposed Exhibit Hall hours
- CAMX Location: Anaheim, CA
- CAMX Virtual Career Fair
- 254 Technical/Education Sessions
- 5+ Networking events
- CAMX Awards featured new technologies in the marketplace
- NEW General Session format - CAMX Live! featured three composites and advanced materials innovators
- NEW CAMX Closing Luncheon - A Group Experience showcased a panel of students, the next generation of industry leaders

A Composites and Advanced Materials Event

COUNTLESS Networking Opportunities

UNRIVALED Exhibit Hall

LARGEST Conference Program

About ACMA

The American Composites Manufacturers Association (ACMA) is the world's largest trade group representing the composites industry. It serves its members and the industry by providing strong, proactive leadership in growing the composites market and technical, legislative and regulatory affairs. To learn more and become a member, visit **www.acmanet.org**.

ACMA
American Composites Manufacturers Association

About SAMPE

The Society for the Advancement of Material and Process Engineering (SAMPE), is a global professional member society, provides information on new materials and processing technology via technical meetings, journal publications or books in which professionals in the field can exchange ideas and air their views. To learn more and become a member, visit **www.sampe.org**.

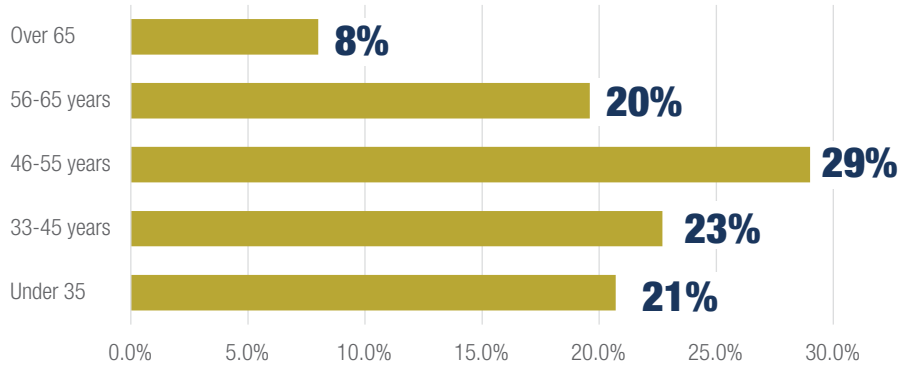
SAMPE

Packed house at the Tuesday Welcome Reception.

Show floor manufacturing demonstrations.

Delegate Demographics

AGE RANGE

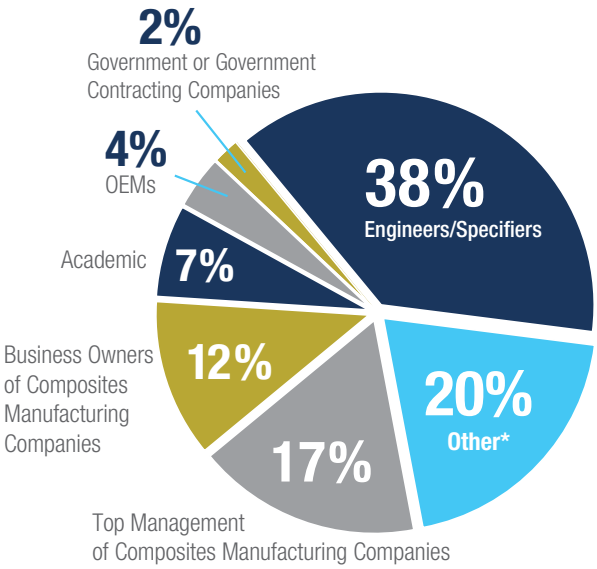


75% of attendee's companies are trying to expand into new markets

79% of companies are interested in reaching international markets, including Europe, South America, North America, Russia, India and China

70% OF ATTENDEES ARE INTERESTED IN ATTENDING CAMX 2017 IN ORLANDO, FLORIDA

ATTENDEE ROLE & COMPANY TYPE



Other* —
3D Printing, 3D-Scanning and Prototyping Equipment, Additive Manufacturing, Aerospace, Automation of Composite Manufacturing and Operations, CFRPT Tape, Green Materials, Laser Marking of Composites, NDI Equipment, FOD Detection Equipment, Pultrusion Equipment, Raw Material Suppliers, Reps and Distributors, Resources for Equipment, Lasers, Composite Tools, etc., Software, Thermosets, Vacuums

MARKET SEGMENTS:

- Aerospace: **41%**
- Automotive: **12%**
- Construction: **6%**
- Sports Equipment: **6%**
- Marine: **5%**
- Military/Government Applications: **5%**
- Less than **5%** per segment —

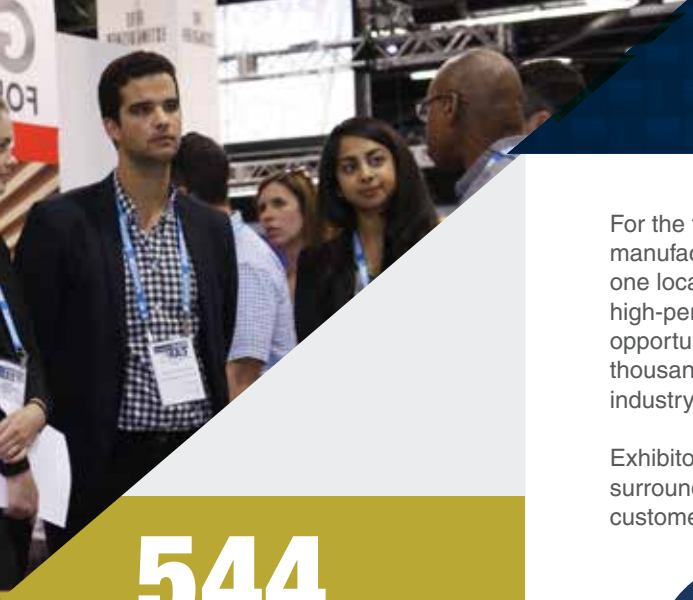
Architectural, Consumer Goods, Space, Pipe and Tank, Energy (Wind), Energy (Power Generation/Other), Mass Transportation, Electronics, Medical, Recreational Vehicles, Bath, Solid Surface/Cast Polymer, Swimming Pools, Other

TOP MOTIVATING REASONS FOR ATTENDING CAMX

- Networking Opportunities: **19%**
- Learn More About the Composites and Advanced Materials Industry: **14%**
- Staying up to Date on Trends and Current Industry Issues: **12%**
- Location: **11%**
- Exhibit Hall: **10%**

Attendees navigating the exhibit hall on opening day.

Poster Boards featuring the latest research.



CAMX Exhibit Hall

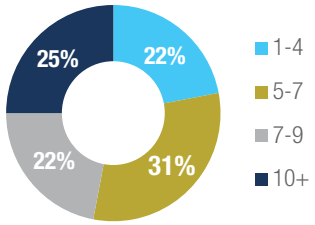
For the third time in North America, composites and advanced materials users, manufacturers and suppliers had access to the full spectrum of industry solutions in one location. Combining high-volume/low-cost material providers with low-volume/high-performance material delivered a unique experience and unprecedented opportunities for attendees and exhibitors alike. With 544 exhibiting companies and thousands of different brands on display at CAMX, the show floor was the largest ever industry marketplace in the Americas.

Exhibitors hosted business meetings in their booths, at the convention center and at surrounding hotels. Off site venues were also packed each evening with receptions, customer dinners and other events filled with CAMX attendees.

544
EXHIBITING COMPANIES

52
EXHIBITING COUNTRIES REPRESENTED

78%
OF ATTENDEES SPENT OVER FIVE HOURS IN THE EXHIBIT HALL



Hours Spent by Attendees in the Exhibit Hall

302,000
Total occupied exhibit hall square feet

EXHIBITOR CATEGORIES

- AAdditive Manufacturing
- Additives/Fire Retardants/Fillers
- Adhesives & Sealants
- Aerospace
- Air Pollution Control
- Armor/Ballistic Materials
- Assembly/Bonding Equipment
- Autoclave
- Automation Equipment
- Auxiliary Processing
- Blenders/Mixers
- Braiding, Knitting/Stitching
- Carbon Fiber Systems
- Carbon Fibers
- Ceramic Materials
- Cleaning Products
- CNC Machining Equipment
- Coatings
- Composites Structural Elements
- Compounds/Putties
- Computer Hardware/Software
- Consulting Services
- Core Materials
- Core Initiators/Catalysts
- Cutting Equipment
- Design Product Development
- Education/Training
- Electrical/Electronic
- Fabricating Supplies
- Fabrics
- Fasteners
- Filament Winding Equipment
- Foams
- Glass Fibers
- Infrared Curing Systems
- Infusion Equipment
- Laser Projection
- Manufacturing Process Development
- Material Research and Development
- Matrix Materials
- Mold Release Systems
- MRO – Maintenance, Repair, Operations
- Nano Materials
- Out-of-Autoclave (OOA)
- Ovens/Dryers/Furnaces
- Preforms
- Prepreg Manufacturing/Handling Equipment
- Prepregs
- Presses/Compression
- Process Control
- Pultrusion Machinery
- Reinforcements
- Repair
- Resin and/or Gel Coat
- Resin Transfer Molding
- Safety Equipment and Supplies
- Sporting Equipment
- Temperature Monitoring/Recording
- Testing Equipment
- Testing Laboratory
- Thermoplastics
- Tools and Tooling Equipment
- Ventilating Equipment/Dust/Odor Control

General Session & Awards

In both the CAMX Awards and the Conference Program, CAMX showcased innovations in materials and manufacturing, best practices in all aspects of the industry, and solutions to challenges. The CAMX Conference Program is unsurpassed in terms of content and experts on hand to share their knowledge. During the most extensive conference program for the industry anywhere in the world, CAMX delivered three days of sessions comprised of Technical Papers, Education Sessions, and Panels in eight tracks and over 46 unique topics and categories. From technical research on all aspects of advanced materials and composites, to manufacturing and business management topics, and trends and insights on the future of the industry, attendees received valuable information presented by expert speakers in all areas.

GENERAL SESSION

CAMX Live, an exciting, new General Session format, featured three individuals who are innovators in using composites and advanced materials to make a positive impact on the world. The speakers were Daniel Preston, CEO/CTO of Luminati, Gregory Haye, Knoxville General Manager at Local Motors and Greg Lynn, Prof. Arch. UCLA, CCO Piaggio Fast Forward & Greg Lynn FORM.

INNOVATION AT CAMX

The CAMX Award recognizes industry innovations and leadership that have the potential to significantly impact composites and advanced materials in the marketplace. The 2016 CAMX Award was presented to two game-changing entries that reflect the depth and breadth of the CAMX theme: Combined Strength. Unsurpassed Innovation. All 10 companies who were finalists, as well as the two winners, join an elite group of leaders and visionaries within the composites and advanced materials community.

COMBINED STRENGTH AWARD

Multi-Material Decklid Concept

Submittedy by: Continental Structural Plastics

UNSURPASSED INNOVATION AWARD

Fire-Resistant FRP Facade Cladding System for Hi-Rise Building

Submitted by: Kreysler & Associates

POSTER SESSION WINNER

1st Place - Overall Winner

Influence of the Adhesive Thickness on the Energy Release Rate of Adhesively-Bonded Composite Repairs

AUTHORS: University Carlos III of Madrid, Lorena Fernández-Cañadas, Inés Iváñez, Sonia Sanchez-Saez, and West Virginia University, Ever Barbero

Attendees enjoy the Hollywood-themed Market Segment Networking Reception

VIRTUAL CAREER FAIR

The CAMX Virtual Career Fair connected CAMX job seekers with companies seeking qualified job candidates within the composites and advanced materials industry. Hosted by **AeroIndustryJobs.com** and **CompositesindustryJobs.com**, the career fair featured 65 composites and advanced materials industry jobs.

Conference Program & Paper Award Winners

254
PRESENTATIONS

313
SPEAKERS

CONFERENCE TRACKS

- Additive Manufacturing
- Advances in Materials
- Business, Regulatory, and Workforce Development
- Design, Analysis, and Simulation
- Green & Sustainability
- Manufacturing & Processing Technologies
- Market Applications (Aerospace and Defense)
- Market Applications (Industrial and Construction)
- Market Applications (Transportation and Consumer)
- Non-Destructive Evaluation & Testing

BEST IN TRACK WINNERS

ADDITIVE MANUFACTURING
UV Cure Applications
Lightweight Replicated Composite Mirrors using UV Cured Resin, *Geena Ferrelli, The Aerospace Corporation*

ADVANCES IN MATERIALS
High Temperature Resins & Adhesives
Advances in MG Resin Composite and Processing for High Temperature Applications, *Richard Hreha, Cornerstone Research Group*

DESIGN, ANALYSIS, & SIMULATION
Advanced Design, Analysis, and Verification
Direct Laminate Selection for Simultaneous Weight Reduction, and, Strength and Layup Speed Increase, *Stephen Tsai, Stanford University*

GREEN & SUSTAINABILITY
Renewable & Bio-Composites Materials
Renewable Thermoplastics from Lignin with Exceptional Properties and their Composites, *Amit Naskar, Oak Ridge National Laboratory*

MANUFACTURING & PROCESSING TECHNOLOGIES
Out-of-Autoclave (OOA)
Demonstration of an Inflatable, Collapsible Pressure Intensifier for Out-of-Autoclave Composite Processing Using BMI Prepreg, *Stephen Scarborough, ILC Dover*

MARKET APPLICATIONS
Aerospace and Defense
Waterjet Capabilities for Aeroengine Manufacturing Needs, *Mohamed Hashish, Flow International Corporation*

MARKET APPLICATIONS
Transportation and Consumer
Improved Performance of Filament-Wound Composite Drive Shafts with Next Generation Inorganic Nanoparticle-Filled Epoxy Resins, *James Nelson, 3M*

NON-DESTRUCTIVE EVALUATION & TESTING
Non-Destructive Inspection & Testing
Time Temperature Indicator Film for Monitoring Composite Repair Adhesive Cure using Thermochromic Fluorescent Molecules, *Ryan Toivola, University of Washington*

Attendees enjoyed topics in 8 composites technology tracks.

Student panel shares their vision for the composites industry.

THANK YOU CAMX 2016 Volunteers & Sponsors

CAMX STEERING COMMITTEE

Kevin Barnett, Core Molding Technologies
Ryan Delahanty, Composites World
Tom Haulik, Hexcel Corporation
Carl LaFrance, Molded Fiber Glass Companies
Kevin McDonald, PPG Industries
Steven Mead, TenCate Advanced Composites
Marcy Offner*, Composites One
Tim Shaughnessy, Rapid Cure Technologies, Inc.
Doug Ward, GE Aircraft Engines

JOINT PROGRAMMING SUBCOMMITTEE

Scott W. Beckwith, SAMPE
Jennifer Brusso, Bradley Corporation
John Busel, ACMA
David Fullwood, Brigham Young University
Matthew Hayden, Polynt
DeWayne Howell, Peak Composites

SAMPE TECHNICAL SUBCOMMITTEE

David Fullwood*, Brigham Young University
DeWayne Howell*, Peak Composites
David J. Kehrl, A&P Technology
David Moon, Apex Analysis
Donald Radford, Colorado State University
Suraj Rawal, Lockheed Martin

ACMA EDUCATION SESSION SUBCOMMITTEE

Juliana Almeida, Reichhold LLC 2
Tony Bennett, AkzoNobel Polymer Chemistry
Bill Dolan, Dolvations
Matthew Hayden*, Polynt
Richard Higgins, HK Research Corporation
James Jones, Composites Consulting Group
Jake Marquis, Kenway Corporation
Rick Pauer, Polynt
Fred Watson, Graco, Inc.

**Committee Chair*

ACMA TECHNICAL PAPERS SUBCOMMITTEE

Cameron Barnes, Bradley Corporation
Jennifer Brusso*, Bradley Corporation
Larry Cox, Structurlite Composites Consultants
Ryan Emerson, PPG Fiber Glass
Sean Evenson, Tecton Products, LLC
Denny Fink, Resin Research and Recovery, LLC
John Green, GSG, Inc.
Dave Herzog, Interplastic Corporation
Ellen Lackey, University of Mississippi
Hildeberto Nava, Reichhold LLC 2
Dailene Osborn, Molded Fiber Glass Companies
Tom Pelt, Retired
Neena Ravindran, Tecton Products, LLC.
Tony Skrobacki, Reichhold LLC 2
Kevin Spoo, Owens Corning
Michael Stevens, Ashland, Inc.
Amol Vaidya, Owens Corning
Sandeep Vennam, PPG Fiber Glass

116
CATEGORY CHAIRS & REVIEWERS

THANK YOU SPONSORS

Elite

Composites One
Dixie Chemical
Owens Corning
Reichhold

Premier

Ashland
JUSHI USA
North American Composites / Interplastic Corporation
Polynt Composites

Supporter

AIRTECH Advanced Materials Group
AOC
Chem Trend
Chromaflo Technologies
OMYA
PolyOne Advanced Composites
Strongwell
TEC

Contributor

BYK Additives & Instruments
CONTROX-NEUHÄUSER Precision Cutting Tools
Johns Manville
The R.J. Marshall Company
Zircar

CAMX

THE COMPOSITES AND ADVANCED MATERIALS EXPO

September 11-14, 2017: Conference / September 12-14, 2017: Exhibits
Orange County Convention Center / Orlando, Florida

SAVE THE DATE
CAMX 2017

www.theCAMX.org

COMBINED **STRENGTH**
UNSURPASSED **INNOVATION**

CAMX RETURNS TO THE
EAST COAST.

PRODUCED BY

ACMA American Composites Manufacturers Association

SAMPE

OFFICIAL MEDIA PARTNER

CW CompositesWorld