



Picture © Dallas Convention & Visitors Bureau

# **SAMPE Fall Technical Conference and Exhibition**

**November 6-9, 2006  
Dallas, Texas  
Fairmont Hotel-Dallas**

**Global Advances in Materials and Process Engineering**

## **Technical Program and Exhibitors Guide**



**Sponsored by SAMPE's New Jersey and Dallas/Fort Worth Chapters**

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# Welcome! Thanks for joining us in Dallas.

Welcome to Dallas and the 38<sup>th</sup> International SAMPE Technical Conference. SAMPE's New Jersey and Dallas/Fort Worth Chapters take exceptional pride in hosting this dynamic event and invite everyone to participate in all aspects of the conference. The theme is "Global Advances in Materials and Process Engineering" and 110 technical papers are being presented together with panel sessions, educational tutorials, vendor/supplier exhibits and a special nanocomposites track to update you on considerable technology.

Networking, socializing and more will be fostered by a Welcome Reception on Tuesday afternoon, a SAMPE Night at Gilley's on Wednesday evening, and an exclusive tour of the Composite Development Center at Bell Helicopters on Thursday afternoon.

We hope your stay in Dallas is a pleasant one, as Dallas is the heart of hospitality and the Fall Technical Conference will offer countless networking opportunities with the key leaders of the global M&P Industry.

Benjamin Rasmussen and Terry Stone  
General Co-Chairmen  
2006 SAMPE Fall Technical Conference (38<sup>th</sup> ISTC)

## Conference Sponsors



## SAMPE 2006/Dallas Fall Technical Conference Committee

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Technical Program Co-Chairs

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Finance Chair John Osterdorf, USA ARDEC/RDE COM

Arrangements Chair Narvel Rogers, Bell Helicopter (Retired)

## Outstanding Papers by SAMPE Members for the SAMPE Fall Technical Conference, Dallas

Award presentation Wednesday, November 8<sup>th</sup> at 8:00 a.m. in the Gold Room

### 1st Place: Fabrication and Mechanical Characterization of Carbon Nanotube Yarns, 3-D Braids, and Their Composites

A. Bogdanovich, D. Mungalov, 3TEX, Inc., Cary, NC; P. Bradford, S. Hudson, North Carolina State University, College of Textiles, Raleigh, NC; S. Fang, M. Zhang, R.H. Baughman, University of Texas at Dallas, NanoTech Institute, Richardson, TX

### 2nd Place: Improving Interfacial Bonding and Load-Transfer in Nanocomposite Through Grafting Diethyltoluenediamines on SWNTs

S. Wang, Z. Liang, B. Wang, C. Zhang, Florida State University, Tallahassee, FL; T. Liu, University of British Columbia, Vancouver, Canada

### 3rd Place: Membrane Based VARTM Processing: Modeling and Characterization

S.C. Amouroux, J.F. Henau, D. Heider, J.W. Gillespie Jr., University of Delaware, Newark, DE

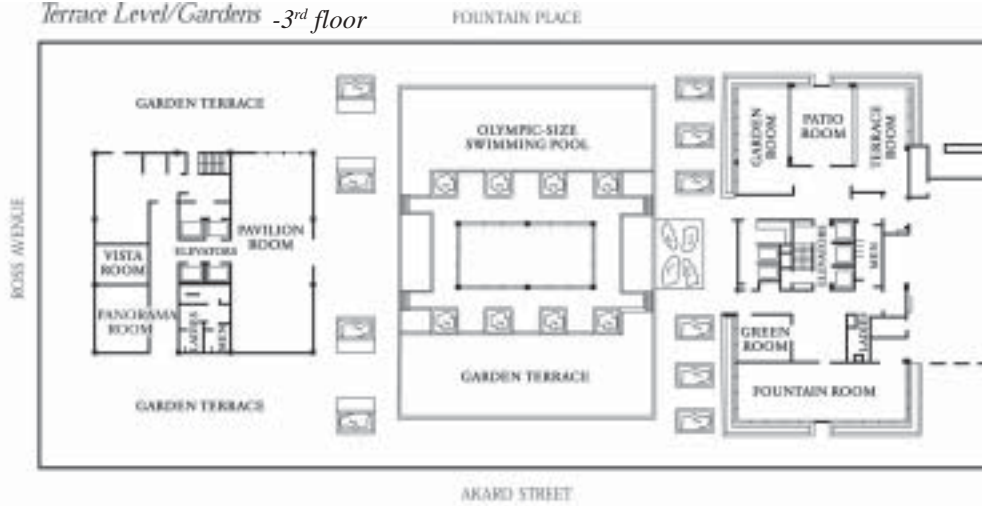
*Congratulations to the winners of the Outstanding Paper Awards!*



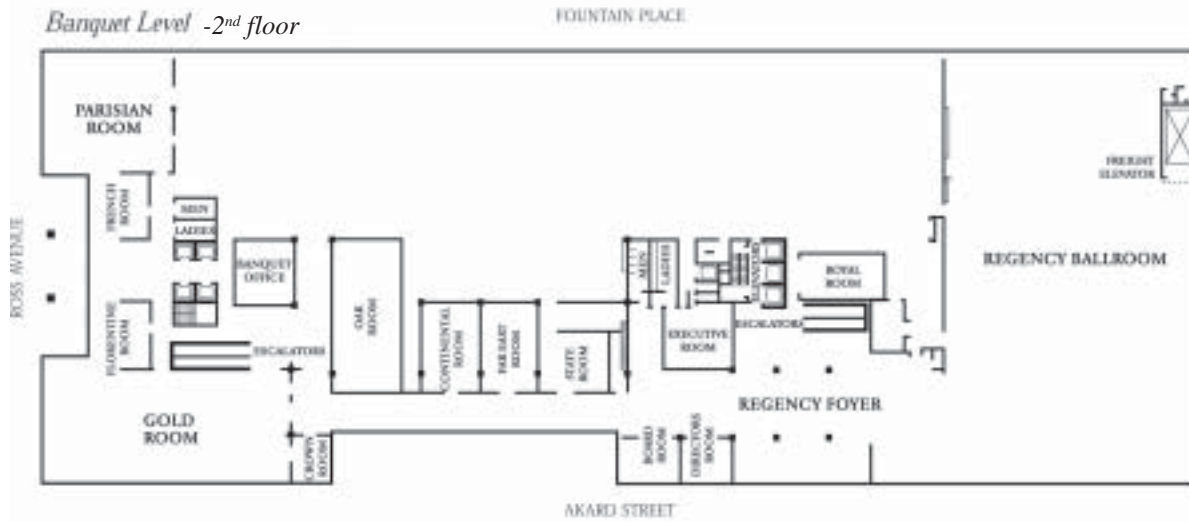


# Fairmont Hotel

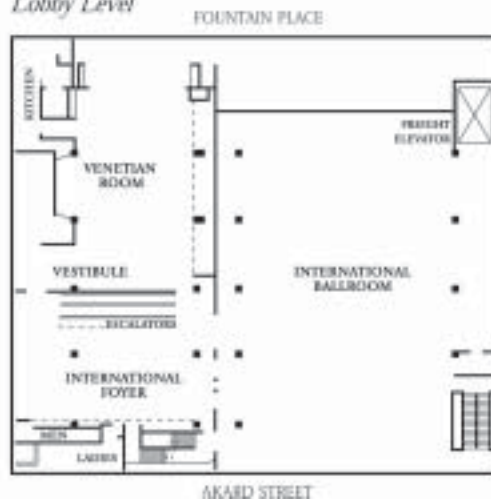
*Terrace Level/Gardens -3<sup>rd</sup> floor*



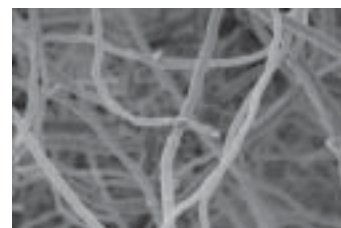
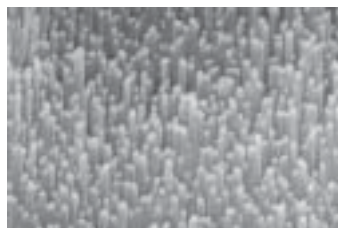
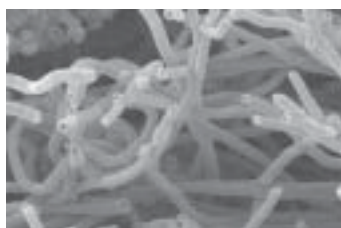
*Banquet Level -2<sup>nd</sup> floor*



*Lobby Level*



# Conference within a Conference: Nanocomposites



Booming interest and explosive developments make it necessary for material and process professionals to stay current in the field of nanotechnology. SAMPE is pleased to continue a special nanocomposites track, which was a complete success last year, and is sure to be a hit this year as part of the SAMPE Fall Technical Conference. With three days of sessions, a keynote presentation and a tutorial, you are sure to find programming that is right for you. Nanotechnology programming events being offered: a keynote presentation, several panels and a tutorial.

## Monday, November 6<sup>th</sup>

Parisian Room • 2:00 p.m. – 5:00 p.m.

### **Nanocomposites Technology\***

Tutorial by Dr. Jiang Zhu, NanoRidge Materials Inc., Houston, TX

## Tuesday, November 7<sup>th</sup>

Parisian Room • 9:30 a.m.

### **Nanocomposites: Technical Challenges and Solutions**

Session chaired by David Burton and Patrick Lake, Applied Sciences, Inc., Cedarville, OH

Parisian Room • 1:00 p.m. *Oral Presentations Only*

### **Nanoconstituents: Which One is Right for You?**

Panel moderated by Karla L. Strong and Jennifer C. Fielding, Materials and Manufacturing Directorate, Structural Materials Branch, AFRL/MLBC, WPAFB, OH

Royal Room • 1:00 p.m.

### **Nanomaterials/Nanocomposites Part 1 – Session**

Session chaired by Lawrence Drzal, Michigan State University, East Lansing, MI

## Wednesday, November 8<sup>th</sup>

Gold Room • 8:00 a.m. – 9:00 a.m.

### **Novel Technologies for Fabricating and Applying Multifunctional Carbon Nanotube Yarns and Transparent Sheets**

Nanotechnology keynote address by Dr. Ray Baughman, Professor of Chemistry and Director of the NanoTech Institute, University of Texas at Dallas, Dallas, TX

Parisian Room • 9:30 a.m. *Oral Presentations Only*

### **Health, Safety and Risk Management of Nanomaterials**

Panel moderated by Fiona Mowat, Exponent, Menlo Park, CA

Far East Room • 1:00 p.m. *Oral Presentations Only*

### **Fiber Reinforced Polymer Nanocomposites**

Panel moderated by Brian P. Rice, University of Dayton Research Institute, Dayton, OH

Parisian Room • 1:00 p.m.

### **Nanomaterials/Nanocomposites Part 2 - Session**

Session chaired by Benji Maruyama, AFRL/MLBCO, WPAFB, OH and Enrique Barrera, Rice University, Houston, TX

## Thursday, November 9<sup>th</sup>

Parisian Room • 8:00 a.m.

### **Nanomaterials/Nanocomposites Part 3 - Session**

Session chaired by Joseph Koo, University of Texas at Austin, Austin, TX and M. Jason Adams, Lockheed Martin, Ft. Worth, TX

Parisian Room • 1:00 p.m.

### **Nanomaterials for Space Applications**

Session chaired by Ed Silverman, Northrop Grumman, Redondo Beach, CA

\*Tutorial requires a separate registration fee.

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# SAMPE Fall Technical Conference

## Monday, November 6

Registration 7:00 a.m. - 5:00 p.m.

Directors Room 8:00 a.m.  
SAMPE Board of Directors Meeting

### SAMPE Tutorials 9:00 a.m. - 12:00 noon

#### Continental Room

- Introduction to Composite Materials

#### State Room

- Preforming Technology for Structural Composites

### SAMPE Tutorials 2:00 p.m. - 5:00 p.m.

#### Continental Room

- Composite Structures: Fabrication and Manufacturing Processes

#### Far East Room

- Introduction to Liquid Composite Molding Processing

#### Parisian Room

- Nanocomposites Technology

#### State Room

- Thermoplastic Composites Technologies

## Tuesday, November 7

Registration 7:00 a.m. - 5:00 p.m.

#### Gold Room

### Keynote Address 8-9 a.m.

- Daniel P. McIlroy, Bell Helicopter Textron, Fort Worth, TX "Material Challenges for Next Generation Aircraft"

### Sessions 9:30 a.m.

#### Oak Room

- Design & Analysis - Part 1

#### Continental Room

- New Advances in Resin Infusion Processing

#### Far East Room

- Innovative Material Forms

#### State Room

- Fire Safe Materials - Part 1

#### Parisian Room

- Nanocomposites: Technical Challenges and Solutions

### Panel 9:30 a.m.

#### Gold Room

- The Global Carbon Fiber Quandary: Glory or Glut?

#### Regency Ballroom

### Exhibits 10:00 a.m. - 4:00 p.m.

### Sessions 1:00 p.m.

#### Oak Room

- Design & Analysis - Part 2

#### Royal Room

- Nanomaterials/Nanocomposites-Part 1

#### Continental Room

- Thermoplastic Composites

### Session 3:30 p.m.

#### Continental Room

- Natural Fiber Composites

### Panels 1:00 p.m.

#### Gold Room

- SAMPE Technical Committee Panel: Annual Industry M&P Technology Review

#### Parisian Room

- Nanoconstituents: Which One is Right for You?

#### Oak Room

- Enhancing the Non-Structural Functionalities of Fiber Reinforced Composites

### Welcome Reception 4:30 p.m. - 5:30 p.m.

**All attendees are welcome. Join us at the pool deck at the Fairmont Hotel.**

## Wednesday, November 8

Registration 7:00 a.m. - 4:30 p.m.

#### Gold Room

### Nanotechnology Keynote Address 8-9 a.m.

- Dr. Ray Baughman, NanoTech Institute, University of Texas, Dallas, TX "Novel Technologies for Fabricating and Applying Multifunctional Carbon Nanotube Yarns and Transparent Sheets"

### Sessions 9:30 a.m.

#### Far East Room

- New Materials Applications and Challenges for Aircraft

#### Continental Room

- Advanced Composites Manufacturing

#### Royal Room

- Fiber Reinforcement, Textiles and Preforms

#### State Room

- Coatings and Sealants

### Panel 9:30 a.m.

#### Parisian Room

- Health, Safety and Risk Management of Nanomaterials

#### Regency Ballroom

### Exhibits 10:00 a.m. - 4:00 p.m.

### Sessions 1:00 p.m.

#### Parisian Room

- Nanomaterials/Nanocomposites-Part 2

#### State Room

- Fire Safe Materials - Part 2

#### Continental Room

- Adhesives, Joining and Bonding

### Session 3:30 p.m.

#### Continental Room

- Sandwich, Marine and Transportation

### Panels 1:00 p.m.

#### Oak Room

- Aircraft Structures Lifecycle: Reclamation and Reuse of Carbon Fiber

#### Gold Room

- Fiber Reinforced Polymer Nanocomposites

### Special Seminar Offering 1:00 p.m.

#### Far East Room

- High Temperature Composite Market Overview

### SAMPE Night at Gilley's 6:00 p.m. - 9:00 p.m.

# At-A-Glance

**Thursday, November 9**

Registration 7:30 a.m. - 2:30 p.m.

## Sessions

**8:00 a.m.**

### Continental Room

- Aircraft Materials Recycling

### Parisian Room

- Nanomaterials/Nanocomposites-Part 3

### State Room

- Metals, Metal Matrix Composites & Thermal Management

### Oak Room

- Composites Repair, Testing and Inspection Technologies

## George Lubin Award



*Jon B. DeVault, President of DeVault and Associates, has been selected by SAMPE's Board of Directors for the George Lubin Memorial Award, SAMPE's highest honor. This award is bestowed on those who have made remarkable contributions to the materials and processing (M&P) industry. Only 12 George Lubin Memorial Awards have been distributed since its establishment in 1986. The last was presented in 2004.*

*Award presentation Tuesday, November 7<sup>th</sup> at 8:00 a.m. in the Gold Room.*

## Sessions

**1:00 p.m.**

### Continental Room

- High Temperature Materials

### Parisian Room

- Nanomaterials for Space Applications

## Special Seminar Offering

**1:00 p.m.**

### Oak Room

- Sandwich and Core Technology: Overview and Applications Update

## Plant Tour

**1:00 p.m.**

- Bell Helicopter Textron Facility

ITAR

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**Information**

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Join us on Thursday afternoon, November 9, 2006, for an exclusive tour of the Composite Development Center at Bell Helicopters in Hurst, Texas. This unprecedented tour will take you behind the scenes of one of the most advanced automated composites manufacturing centers in the world. The shuttle bus will begin loading at 12:30 p.m. in front of the Fairmont Hotel and leave at 1:00 p.m. sharp, to travel to the facility. You are expected to be back at the hotel by 4:30 p.m.

### IMPORTANT:

1. Because of the advanced nature of the technologies that will be demonstrated, this tour is ITAR RESTRICTED. (See page 8 for ITAR information).  
We must take these steps in order to properly comply with federal ITAR regulations. There are no exceptions.
2. Space is limited to the first 45 people with ITAR clearance.
3. To take this tour, you must ride the SAMPE bus. No individual vehicles are allowed.

ITAR

## Tutorials\* • 9:00 a.m. – 12:00 Noon

### Continental Room

#### Introduction to Composite Materials

Dr. Carl Zweben, Composites Consultant, Devon, PA

### State Room

#### Preforming Technology for Structural Components

Prof. Andrew Mills, Cranfield University, Milton Keynes, UK

## Tutorials\* • 2:00 p.m. – 5:00 p.m.

### Continental Room

#### Composite Structures: Fabrication and Manufacturing Processes

Dr. James C. Leslie, Advanced Composite Products & Technology, Huntington Beach, CA

### Far East Room

#### Introduction to Liquid Composite Molding Processing

Prof. Dirk Heider, Center for Composite Materials/University of Delaware, Newark, DE

### Parisian Room

#### Nanocomposites Technology

Dr. Jiang Zhu, NanoRidge Materials Inc., Houston, TX

### State Room

#### Thermoplastic Composites Technologies

Arnt Offringa, Stork Fokker AESP B.V., Hoogeveen, The Netherlands

**\*All tutorials require a special registration fee.**

## Important session information for all attendees.

ITAR

### SAMPE Restricted Papers —ITAR Regulations Session Admittance

(REVISED PROCEDURES 6/05)

Several papers to be presented at this conference and the plant tour will be restricted, governed by ITAR (International Traffic in Arms Regulations). The U.S. citizens SAMPE list used at previous conferences will not be available. If you plan to attend any presentations restricted by ITAR, you must bring proof of citizenship plus the other verification documents as shown below. Please note that only U.S. citizens and U.S. Resident Aliens can be considered for attendance at these restricted presentations.

Admittance to restricted sessions and access to restricted technical papers is implemented and controlled by U.S. International Traffic in Arms Regulations (ITAR). All restricted session attendees MUST abide by the procedures and submittal of verification documents as noted below – no exceptions:

ATTENDEE CLASSIFICATION	IDENTIFICATION & PROOF OF EMPLOYMENT REQUIREMENTS
U.S. Government Employees	<ol style="list-style-type: none"> <li>1. Proof of Citizenship (for example, passport, birth certificate, voters registration card, naturalization papers), <b>and</b>,</li> <li>2. Personal <u>photographic</u> identification (passport, driver's license, corporate ID, etc.)</li> </ol>
U.S. Citizens	<ol style="list-style-type: none"> <li>1. Proof of Citizenship (for example, passport, birth certificate, voters registration card, naturalization papers), <b>and</b>,</li> <li>2. Personal <u>photographic</u> identification (passport, driver's license, corporate ID, etc.), <b>and</b>,</li> <li>3. Certification credentials based on DD Form 2345 (see below for details)</li> </ol>
Resident Aliens (U.S.)	<ol style="list-style-type: none"> <li>1. Resident Alien Card, <b>and</b>,</li> <li>2. Personal <u>photographic</u> identification (passport, driver's license, corporate ID, etc.), <b>and</b>,</li> <li>3. Certification credentials based on DD Form 2345 (see below for details)</li> </ol>

DD Form 2345 individual certification credentials (required for U.S. & Resident Aliens) must be from one of the following:

1. Copy of an approved and active DD Form 2345 for the individual, **or**,
2. Copy of an approved and active DD Form 2345 for the individual's employer **PLUS** evidence of current employment status with that employer (corporate ID, business card, etc.), **or**,
3. A listing of the individual's employer in the most recent DoD quarterly Qualified U.S. Contractor Access List **PLUS** evidence of current employment status with that employer (corporate ID, business card, etc.).

DD Form 2345 may be downloaded and completed online in order to apply for approval to be listed on the Qualified U.S. Contractor List, [www.dliss.dla.mil/jcp/](http://www.dliss.dla.mil/jcp/). Allow at least 4 weeks prior to the SAMPE symposia or technical conference dates for this process.

For further information, call 626/331-0616 ext. 610 or E-Mail: [priscilla@sampe.org](mailto:priscilla@sampe.org)



**8:00 a.m. – 9:00 a.m.**

*Gold Room*

## **Keynote Address**

### **Material Challenges for Next Generation Aircraft**

Daniel P. McIlroy, Vice-President, Textron Six Sigma, Bell Helicopter Textron, Fort Worth, TX



**9:30 a.m. Oral Presentations Only**

*Gold Room*

### **The Global Carbon Fiber Quandary: Glory or Glut? - Panel**

Moderators: Judy Hazen and Sara Black, *High Performance Composites*, Wheat Ridge, CO

In the past, carbon fiber production was closely aligned with demand from aerospace and sporting goods applications. Over the last decade, producers have sought to broaden the end user base and are succeeding possibly beyond their wildest expectations. With fuel prices expected to stay high, not only are aircraft builders planning to use lightweight composite materials at unprecedented levels, but many new and growing applications—such as wind blades and offshore pipe—are pushing industrial growth projections to over 10% annually. Are these applications real and will the supply of fiber be there in time to meet demand? Members of this panel will discuss projected market growth and investment opportunities and announced capacity expansion. Panelists will offer suggestions on how to work with suppliers to forecast demand and secure supply. Ways to optimize product design, material selection, and processibility to get the most value from your carbon fiber composite will also be discussed.

Panelists:

Trevor Bohn, RSM EquiCo Capital Markets LLC

Tom Haulik, Cytec Carbon Fibers

Mike Holland, Sparta Inc.

Mike Kinsella, Toho Carbon Fibers

Tim McCarthy, Zoltek Corporation

Chris Red, *Composite Market Reports*

*Parisian Room*

### **Nanocomposites: Technical Challenges and Solutions - Session**

Chairs: David Burton and Patrick Lake, Applied Sciences, Inc., Cedarville, OH

#### **9:30 a.m. Conductive Long Fiber Reinforced Thermoplastics Using Carbon Nanofibers**

C. Leer, F.W.J. van Hattum, O.S. Carneiro, Institute of Polymers and Composites, University of Minho, Guimaraes, Portugal

#### **10:00 a.m. Damping of CNF Nanocomposites**

J. Finegan, Central Michigan University, Mt. Pleasant, MI

#### **10:30 a.m. Polymer Nanocomposites for Linerless Composite Tanks**

S. C. Arzberger, M. Tomlinson, J. Cronin, K. Ryan, K. Mallick, N. Munshi, Composite Technology Development, Inc., Lafayette, CO

#### **11:00 a.m. Prepreg Fabrication with Nano-Enhanced Resin Systems**

A. Fritts, S. Robitaille, NanoSpere LLC, Akron, OH

#### **11:30 a.m. Electrically Conductive CNF Composites in a HDPE Matrix**

K. Alam, J. Morosko, Ohio University, Athens, OH; A. Chatterjee, University of Delaware, Newark, DE

#### **12:00 p.m. Mechanisms for the Self Assembly of a Structured Network of Conductive Nanoparticles in Composite Materials**

K. Howard, K. Eisemon, Plasticolors, Ashtabula, OH

*Oak Room*

### **Design & Analysis Part 1 - Session**

Chairs: Keith Kedward, University of California/Santa Barbara, Santa Barbara, CA and Melanie Violette, Raytheon Aircraft Co., Wichita, KS

#### **9:30 a.m. Design Tailoring for Pressure Pillowing Using Tow-placed Steered Fibers**

A. Alhaj-Ahmad, M.M. Abdalla, Z. Gürdal, Delft University of Technology, Zuid Holland, The Netherlands

#### **10:00 a.m. Improving Shear Capacity of Reinforced Concrete Members Using Externally Bonded Fiber Reinforced Polymers: A Modified Design Approach**

M.A. Faruqi, I. Mullick, A. Cholkar, Texas A & M University-Kingsville, Kingsville, TX; R. Agarwala, East Carolina University, Greenville, NC

#### **10:30 a.m. Composite End-Fittings for Lightweight Telescope Applications**

F.E. Penado, S.T. Broome, Northern Arizona University, Flagstaff, AZ; R.C. Romeo, R.N. Martin, Composite Mirror Applications, Inc., Tucson, AZ; J.H. Clark, III, Naval Research Lab/Navy Prototype Optical Interferometer, Flagstaff, AZ; J.P. Walton, Interferometrics, Inc./Navy Prototype Optical Interferometer, Flagstaff, AZ

#### **11:00 a.m. Probabilistic Finite Element Analysis of Modified ASTM D3039 Tension Test for Marine Grade Polymer Matrix Composites**

J.W. Nader, H.J. Dagher, R. Lopez-Anido, F.E. Chiti, G.N. Fayad, University of Maine, Orono, ME; L. Thomson, Applied Thermal Sciences, Orono, ME; P.E. Hess, Naval Surface Warfare Center, West Bethesda, MD

*Continental Room*

### **New Advances in Resin Infusion Processing - Session**

Chairs: Giuseppe Palmese, Drexel University, Philadelphia, PA and Dirk Heider, University of Delaware, CCM, Newark, DE

#### **9:30 a.m. Outstanding Paper Award 3<sup>rd</sup> Place—Membrane Based VARTM Processing: Modeling and Characterization**

S.C. Amouroux, J.F. Henau, D. Heider, J.W. Gillespie Jr., University of Delaware, Newark, DE

#### **10:00 a.m. Optimization of the Location of Gates and Filling Pattern Sensors Using Genetic Algorithm in Resin Transfer Molding**

P. Kashani, B. Minaie, A. Rodriguez, Wichita State University, Wichita, KS

#### **10:30 a.m. Autoclave-Based Vacuum Assisted Resin Transfer Molding**

D. Heider, Y. Zhang, P. Schulze, C. Baudron, University of Delaware, Newark, DE; A. Arnaud, S. Dellus, Dassault-Aviation, Paris, France

#### **11:00 a.m. Modeling of the Elastic Membrane Deforming Around a Surface with Cavities**

L. Vemuri, S.-Y. Luo, University of Nevada, Reno, NV; L. Clements, 2Phase Technologies, Inc., Dayton, NV

#### **11:30 a.m. Modeling and Simulation of Resin Flow in Resin Infusion Processes such as VARTM, VAP and Compression RTM**

P. Simacek, S.G. Advani, University of Delaware, Newark, DE

## Far East Room

### Innovative Material Forms - Session

Chairs: Bob Griffiths, ERG LTD, Somerset, UK and Dale Brosius, Quickstep Technologies, Brighton, MI

#### 9:30 a.m. Lightweight Thermoplastic Beams

A. Offringa, J. List, Stork Fokker AESP B. V., Hoogeveen, The Netherlands

#### 10:00 a.m. Multifunctional Structural Composite Batteries

J.F. Snyder, R.H. Carter, E.H. Ngo, E.L. Wong, P.-A. Nguyen, E.D. Wetzel, U.S. Army Research Laboratory, Aberdeen Proving Ground, MD; K. Xu, Army Research Laboratory, Adelphi, MD

#### 10:30 a.m. Multifunctional Structural Composite Capacitors for U.S. Army Applications

D.J. O'Brien, D.M. Baechle, E.D. Wetzel, U.S. Army Research Laboratory, Aberdeen Proving Ground, MD

#### 11:00 a.m. Quickstep Processing of an AGATE Qualified Carbon Epoxy Prepreg

D. Brosius, H. Law, Quickstep Technologies, South Fremantle, Western Australia; S. Tiam, N. Odagiri, Toray Composites Inc., Tacoma, WA

#### 11:30 a.m. Effects of Ultrathin Fibers as Interlayer on the Fracture Toughness of Glass/Epoxy Composites

L. Liu, Z. Huang, G. Dong, X. Han, School of Aerospace Engineering & Mechanics, Tongji University, Shanghai, China

## State Room

### Fire Safe Materials Part 1 - Session

Chairs: Alexander B. Morgan, University of Dayton Research Institute, Dayton, OH and Anteneh Z. Worku, Dow Chemical, Midland, MI

#### 9:30 a.m. Fire Safety of Transportation Vehicles

M. M. Hirschler, GBH International, Mill Valley, CA

#### 10:00 a.m. Flammability and Mechanical Properties of Polyolefins Containing Intumescent Flame Retardant Systems

T. Hatanaka, H. Murase, R. Kimura, T. Funamizu, ADEKA Corporation, Saitama City, Japan; G. Zingde, K. Tajima, Amfine Chemical Corporation, Upper Saddle River, NJ

#### 10:30 a.m. Making Nanotechnology Work in FR Compositions with Titanates and Zirconates - I

S.J. Monte, Kenrich Petrochemicals, Inc., Bayonne, NJ

#### 11:00 a.m. Making Nanotechnology Work in FR Compositions with Titanates and Zirconates - II

S.J. Monte, Kenrich Petrochemicals, Inc., Bayonne, NJ

#### 11:30 a.m. Small Scale Flammability Testing via Microscale Combustion Calorimetry

A.B. Morgan, University of Dayton Research Institute, Dayton, OH; J.W. Gilman, National Institute of Standards and Technology, Gaithersburg, MD

#### 12:00 p.m. Development of Rate Expressions for Polymer Decomposition Reactions

K.L. Erickson, Sandia National Laboratories, Albuquerque, NM

#### 1:00 p.m. Oral Presentations Only

##### Gold Room

### SAMPE Technical Committee Panel: Annual Industry M&P Technology Review

Moderators: Linda Clements, 2Phase Technologies, Dayton, NV and Vince Bailey, Composites Specialists, Laguna Niguel, CA

The panel members will address current M&P technology by discussing what advances have been made, what the challenges and issues are within the marketplace, what breakthroughs might be expected in the near future, and what developments are necessary to broaden the market to potential applications. The panelists will provide a brief overview of each of their area's technology and will be available for interaction among panel members, the news media and the attendees.

##### Panelists:

Oleg Efimov, VEAL Sensor

Srinivasa Iyer, CES Inc. - FRP/Infrastructure

Robert Shinavski, Hyper-Therm HTC Inc. - Ceramics, Metal Matrix and Carbon-Carbon

William McCarvill, Commercial Chemistries - Resin Technology

Douglas McCarville, Boeing Integrated Defense Systems - Unmanned Systems

Robert Stratton, Stratton Composite Solutions - Tooling

Paul Wienhold, APL/Johns Hopkins University - Space & Space Manufacturing

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**1:00 p.m. Oral Presentations Only**

*Parisian Room*

## **Nanoconstituents: Which One is Right for You? - Panel**

Moderators: Karla L. Strong and Jennifer C. Fielding, Materials and Manufacturing Directorate, Structural Materials Branch, AFRL/MLBC, WPAFB, OH

The purpose of this discussion panel will be to highlight the many different types of nanoconstituents available for modifying aerospace materials to provide multifunctional capabilities. These nanoconstituents can be incorporated into plastics, organic matrix composites, and other matrix materials for use in next generation aircraft and other high-performance equipment such as ground vehicles, aircraft engines, spacecraft, civil transport, etc. The advantages and disadvantages of each nanoconstituent will be highlighted, along with common issues related to transition of nanoconstituents to applications. This discussion will further understanding of nanoconstituents and nanocomposites by offering attendees a chance to interact directly with the manufacturers of nanoparticulates. Planned panel members include representatives from organizations that make or use single and multi-walled carbon nanotubes, other carbon nanoparticulates, and silicate and metal nanoparticulate forms.

Panelists:

Alan Fischer, Hyperion Catalysis International, Inc.

George Hansen, Metal Matrix Composites, Inc.

Karl Kamena, Southern Clay Products, Inc.

Max Lake, Applied Sciences, Inc.

Joe Lichtenhan, Hybrid Plastics

Zhosef Panosyan, State Engineering University of Armenia

Thomas Pitstick, Carbon Nanotechnologies, Inc.

Daniel Resasco, Southwest NanoTechnologies, Inc.

Brian Rice, University of Dayton Research Institute

**1:00 p.m. Oral Presentations Only**

*Oak Room*

## **Enhancing the Non-Structural Functionalities of Fiber Reinforced Composites - Panel**

Moderator: Charles Lee, AFOSR/NL, Arlington, VA

To enhance the multi-functionalities of traditional continuous fiber reinforced composites, the materials can either be modified to perform other functions, or functional devices can be integrated into or onto the composite structures. One way to enable the later is to put functional devices on flexible substrates, which can then be bonded conformably onto or embedded into the composite structures. This panel will include discussions of both approaches: modifying the composite materials and functionalities based on flexible substrates.

Panelists:

Peter Kofinas, University of Maryland

Gang Li, University of California/ Los Angeles

John Reynolds, University of Florida

Jim Tour, Rice University

Igor Rybalchenko, National Aerospace University of Ukraine

Apoorva Shah, Triton Systems

Ranji Vaidyanathan, Advanced Ceramics Research

*Far East Room*

## **Design & Analysis Part 2 - Session**

Chairs: Keith Kedward, UCSB, Santa Barbara, CA and Melanie Violette, Raytheon Aircraft Co., Wichita, KS

### **1:00 p.m. Design and Fabrication of a Composite Roller Skate Chassis**

S. Sridharala, J. Thota, U. Sakaray, B.J. O'Toole, University of Nevada, Las Vegas, Las Vegas, NV

### **1:30 p.m. Quantitative Assessment of Mixing Quality in Nanoreinforced Polymers Using a Multi-Scale Image Analysis Method**

F. van Hattum, C. Leer, O. Carneiro, Institute for Polymers and Composites, University of Minho, Guimarães, Portugal; B. Maruyama, AFRL/MLBCO, WPAFB, Dayton, OH

### **2:00 p.m. Experimental Study of Residual Stress in Composite During Cure**

H. Hattori, H. Horizonzo, M. Kanemasu, Mitsubishi Heavy Industries, Ltd., Aichi, Japan; M. Fukumoto, Mitsubishi Rayon, Co., Ltd., Nagoya, Japan; K. Osaka, T. Kosaka, Osaka City University, Osaka, Japan

### **2:30 p.m. Idealization Options for Modeling Composites in Finite Element Analysis**

T. Abbey, Noran Engineering, Westminster, CA

### **3:00 p.m. Determination of Cross-Ply Laminate Stacking Sequence for the Compression Strength Testing of a Unidirectional Boron Epoxy Material**

Y. Ng, Wichita State University, Wichita, KS; A. Kumnick, Specialty Materials, Lowell, MA

*Royal Room*

## **Nanomaterials/Nanocomposites Part 1 - Session**

Chair: Lawrence Drzal, Michigan State University, East Lansing, MI

### **1:00 p.m. Characterizations of Carbon Nanotubes upon Radiation Exposures**

J. Zhou, T. Song, S.M. Vilarinho, R. Wilkins, Prairie View A&M University, Prairie View, TX

### **1:30 p.m. Statistical Tools Applied on the Design of Nanocomposite Permeability Experiments**

S.M. Vilarinho, J. Zhou, Prairie View A&M University, Prairie View, TX; S. Naya, R. Artiaga, Universidade da Coruña, Coruña, Spain; D. Hui, University of New Orleans, New Orleans, LA

### **2:00 p.m. Non Linear Creep of Polyethylene Nanocomposites**

N.A. D'Souza, A. Shaito, University of North Texas, Denton, TX; D. Fairbrother, J. Sterling, NASA Wallops Flight Facility, Wallops Island, VA

### **2:30 p.m. Polymer Nanocomposites for Packaging**

L.K. Sahu, N.A. D'Souza, University of North Texas, Denton, TX; S. Pendse, A. Ranade, GE Plastics, Mount Vernon, IN

### **3:00 Multifunctional Polypropylene Composites via Addition of Exfoliated Graphite Nanoplatelets**

K. Kalaitzidou, H. Fukushima, L.T. Drzal, Michigan State University, East Lansing, MI

# Tuesday, November 7<sup>th</sup>

Continental Room

## Thermoplastic Composites - Session

Chairs: David Leach and James Pratte, Cytec Engineered Materials, Anaheim, CA

### 1:00 p.m. High Strength Hollow Glass Microspheres for Thermoplastic Composites

A. D'Souza, 3M Company, St. Paul, MN

### 1:30 p.m. Applications & Processing Techniques for CETEX® Thermoplastics in Aerospace

D. Bernard, Ten Cate Advanced Composites, Inc., Morgan Hill, CA; W. Kok, R. Lenferink, Ten Cate Advanced Composites, Nijverdal, The Netherlands

### 2:00 p.m. Process Optimization for Fiber Placement of Carbon/PEKK Thermoplastic Composites

M. Hojjati, J.H. Chen, M. Tanguay, A. Yousefpour, National Research Council, Quebec, Canada

### 2:30 p.m. Tribological Properties of Xytrex® Polymers of 3P Corporation

J. Ren, Performance Plastics Products, Houston, TX

Continental Room

## Natural Fibers - Session

Chairs: Ellen Lackey, University of Mississippi, Mississippi State, MS and Chad Ulven, North Dakota State University, Fargo, ND

### 3:30 p.m. Comparison of Flax Fiber and Sisal Fiber Reinforced Composites for Structural Applications

C.A. Ulven, M. Tatleri, N. Sailer, North Dakota State University, Fargo, ND; S. Pillay, U.K. Vaidya, University of Alabama at Birmingham, Birmingham, AL

### 4:00 p.m. Screening of Effectiveness of Fiber Treatments for Hemp Fiber Using a Lab-Scale Pultruder

E. Lackey, K. Inamdar, J. Vaughan, J. O'Haver, University of Mississippi, Mississippi State, MS

### 4:30 p.m. Vegetable Oil-Based Epoxy/E-Glass Composite Materials: Properties and Synthesis

M. Tatleri, C.A. Ulven, N. Sailer, D.P. Wiesenborn, K. Tostenson, P. Polansky, A. Krog, North Dakota State University, Fargo, ND

### 4:30 p.m. - 5:30 p.m. Pool (Terrace Level)

### Welcome Reception, Fairmont Hotel

Food, fun and good company! Relax and enjoy yourself as you mingle with exhibitors and colleagues during the SAMPE Welcome Reception

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# Wednesday, November 8<sup>th</sup>

**8:00 a.m. – 9:00 a.m.**

*Gold Room*

## **Nanotechnology Keynote Address**

### **Novel Technologies for Fabricating and Applying Multifunctional Carbon Nanotube Yarns and Transparent Sheets**

Dr. Ray Baughman, Professor of Chemistry and Director of the NanoTech Institute, University of Texas, Dallas, TX



**9:30 a.m. Oral Presentations Only**

*Parisian Room*

## **Health, Safety and Risk Management of Nanomaterials - Panel**

Moderator: Fionna Mowat, Exponent, Menlo Park, CA

There is little debate among scientists regarding the tremendous potential of nanotechnology and the significant advances that will be realized in areas such as: medicine, environmental protection, energy production, communication, and computation. This progress raises important questions regarding the human health and environmental consequences of nanomaterials, generating concern about the potential adverse effects of these materials and the current lack of a regulatory framework to protect worker safety and public health. While many forums have addressed the broad issues surrounding the topic of nanoparticle safety and health, this forum seeks to outline key focus areas and create an open discussion regarding this important and, at times, controversial topic.

Panelists:

Robert Adams, ENVIRON International Corporation  
Gwen Gross, The Boeing Company - Commercial Airplanes  
Matthew S. Hull, Luna Innovations Incorporated  
Kristen Kulinowski, CBEN, Rice University  
Mark Nethner, NIOSH

*Far East Room*

## **New Materials Applications and Challenges for Aircraft - Session**

Chairs: Russell Maguire, The Boeing Company, Seattle, WA and W.H. Katie Zhong, North Dakota State University, Fargo, ND

### **9:30 a.m. Damage Detection of Highly Reliable Advanced Grid Structures for Aircraft**

T. Ozaki, H. Takeya, M. Kume, Mitsubishi Electric Corporation, Advanced Technology R&D Center, Sagamihara, Japan; N. Takeda, University of Tokyo, Tokyo, Japan; N. Tajima, RIMCOF, Tokyo, Japan

### **10:00 p.m. Effects of Reactive Graphitic Nanofibers on Mechanical and Thermal Properties of a Nano-epoxy**

W.H. Zhong, A. Zhamu, S. Jana, Y.P. Hou, J.J. Stone, North Dakota State University, Fargo, ND; J. Li, C.M. Lukehart, Vanderbilt University, Nashville, TN

### **10:30 a.m. Nano-Epoxy and UHMWPE Fiber/Nano-epoxy Composites Under Moisture and UV Radiation**

S. Jana, W.H. Zhong, North Dakota State University, Fargo, ND

### **11:00 a.m. A Reliability Method for Assessing Damage Severity in Composite Structures**

K.Y. Lin, A.V. Styuart, University of Washington, Seattle, WA

*Continental Room*

## **Advanced Composites Manufacturing - Session**

Chairs: Frances Abrams, AFRL, WPAFB, OH and Shaw Lee, Lockheed Martin Aeronautics Company, Fort Worth, TX

### **9:30 a.m. Braided, Resin Infused Process for Low Cost Composite Engine Duct**

ITAR

S. Lee, Lockheed Martin Aeronautics Company, Fort Worth, TX, D. Armstrong, G. Sharpless, EDO Corporation, South Walpole, MA

### **10:00 a.m. Productivity of "Depleted" Oil and Gas Wells Restored Through the Use of Composite Drill Pipe**

J.C. Leslie, J.C. Leslie II, J.T. Heard, L. Truong, Advanced Composite Products & Technology, Inc., Huntington Beach, CA; G. Covatch, DOE, Oregon Town, WV

### **10:30 a.m. Composites Affordability Initiative: Successes, Failures, and Where Do We Go From Here**

J.D. Russell, Air Force Research Laboratory, WPAFB, OH

### **11:00 a.m. The Composites Affordability Initiative - Phase III Review**

S. Wanthal, The Boeing Company, St. Louis, MO

### **11:30 a.m. The New L-O-T-U-S Filament-Winding Method for Composite Fabrication**

A.K. Allen, J.V. Anderson, Lotus Designs, LLC, Salt Lake City, UT; P. Carter, Brigham Young University, Provo, UT

*Royal Room*

## **Fiber Reinforcement, Textile & Preform - Session**

Chairs: Ray Baughman, NanoTech Institute, University of Texas at Dallas, Dallas, TX; Frank Ko, Drexel University, Philadelphia, PA; and Alex Bogdanovich, 3TEX, Cary, NC

### **9:30 a.m. 3D-Braided Textile Preforms - From Virtual Design to High-Performance-Braid**

J. Stueve, T. Gries, Institut fuer Textiltechnik, RWTH Aachen University, Aachen, Germany; N.T. Enrech, University of Zaragoza, Zaragoza, Spain

### **10:00 a.m. Advancements in Design and Manufacture of 3-D Braided Preforms for Complex Composite Structures**

D. Mungalov, P. Duke, A. Bogdanovich, 3TEX, Inc., Cary, NC

### **10:30 a.m. Outstanding Paper Award 1<sup>st</sup> Place-Fabrication and Mechanical Characterization of Carbon Nanotube Yarns, 3-D Braids, and Their Composites**

A. Bogdanovich, D. Mungalov, 3TEX, Inc., Cary, NC; P. Bradford, S. Hudson, North Carolina State University, College of Textiles, Raleigh, NC; S. Fang, M. Zhang, R.H. Baughman, University of Texas at Dallas, NanoTech Institute, Richardson, TX

### **11:00 a.m. Carbon Fibre Composite Space Frames for Sports Cars Using Novel Textile Composites -Materials, Process Development and Structural Testing**

S. Lazarus, P. Lalouer, R. Smith, A. Mills, Composites Centre, SAS, Cranfield University, United Kingdom

# Wednesday, November 8<sup>th</sup>

## State Room

### Coatings and Sealants - Session

Chairs: Jude O. Iroh, University of Cincinnati, Cincinnati, OH and Pam Strong, The Boeing Company, Huntington Beach, CA

#### 9:30 a.m. Development of a Next Generation Non-Chromated Zero VOC Water Based Primer for Adhesive Bonding Applications

K. Shah, D. Kohli, Cytec Engineered Materials, Havre De Grace, MD

#### 10:00 a.m. The Permeability Characteristics of Silicone Rubber

H. Zhang, A. Cloud, Arlon Silicone Technologies Division, Bear, DE

#### 10:30 a.m. Processing and Properties of Environmentally Friendly Corrosion Resistant Hybrid Nanocomposite Coatings

D. Rajamani, J.O. Iroh, University of Cincinnati, Cincinnati, OH

#### 1:00 p.m. Oral Presentations Only

## Oak Room

### Aircraft Structure Lifecycle – Reclamation and Reuse of Carbon Fiber - Panel

Moderators: William Carberry and Peter George, The Boeing Company, Seattle, WA

Increasing use of carbon fiber in aerospace and industrial applications will be generating more manufacturing scrap and end of life carbon fiber containing material in the coming years. Our industry routinely deals with metallics in these situations, but will we be ready for the shift in structural materials that is underway? Recent developments in carbon fiber reclamation processes, carbon fiber applications and demand, put us in a position to change the paradigm of how we deal with carbon fiber and give the industry an opportunity to improve environmental stewardship. This panel will discuss current carbon fiber recycling developments and a view towards an economically sustainable carbon fiber recycling industry.

#### Panelists:

Ron Allred, Adherent Technologies

John Davidson, Milled Carbon U.K

Les Harmon, The Boeing Company

Min Chung Li, BAE Systems Composite Structures, Inc.

Robert MacNeil, Quantum Composites, Inc.

Steve Pickering, University of Nottingham

#### 1:00 p.m. • Oral Presentations Only

## Gold Room

### Fiber Reinforced Polymer Nanocomposites - Panel

Moderator: Brian P. Rice, University of Dayton Research Institute, Dayton, OH

Over the past five years, fiber reinforced polymer (FRP) nanocomposites have begun the transition from mere hype to real applications. Federal and industry funding to evaluate today's incremental, yet substantive, property improvements has been on the rise. The technology, in several instances, can be looked at as value-centric rather than exorbitant. Multifunctional characteristics such as electrical and thermal conductivity improvements are well established, while strength and modulus improvement is very formulation dependant. This panel will review the technology transition taking place across the aerospace industry with presentations being made by key panelists followed by an interaction with the audience.

#### Panelists:

Brian Rice, University of Dayton Research Institute

Elena Borisenko, Institute of Solid State Physics, Russian Academy of Sciences

Charles Lee, AFOSR

Russell Maguire, The Boeing Company

Susan Robitaille, NanoSpense

Eugene Shin, OAI – NASA Glenn Research Center

Edward Silverman, Northrop Grumman Space Technology

Ben Wang, Florida State University

## Parisian Room

### Nanomaterials/Nanocomposites Part 2 - Session

Chair: Benji Maruyama, AFRL/MLBCO, WPAFB, OH and Enrique Barrera, Rice University, Houston, TX

#### 1:00 p.m. Multifunctional Carbon Nanotube/Epoxy Composites: Processing and Characterization

E.T. Thostenson, T. Chou, University of Delaware, Newark, DE

#### 1:30 p.m. Electrically Conductive Thermoplastic Polyimide Resins and Composites

G. Hansen, Metal Matrix Composites, Midway, UT; J. Bell, Fibernide, Ontario, Canada; G. Poe, SRS Technologies, Huntsville, AL; M. Alexander, S. Juhl, B. Black, H. Dowty, AFRL, WPAFB, OH

#### 2:00 p.m. Thermal Conductivity of Polymer/Carbon Nano-filler Blends

S. Ghose, D.C. Working, J.W. Connell, J.G. Smith, Jr., NASA Langley Research Center, Hampton, VA; K.A. Watson, D.M. Delozier, National Institute of Aerospace, Hampton, VA; Y.P. Sun, Y. Lin, Clemson University, Clemson, SC

#### 2:30 p.m. CNT/VGCF Reinforced CF/Epoxy Composites: The Role of Nanofibers

G.M. Rojas, E. Barrera, Rice University, Houston, TX; B. Maruyama, AFRL/MLBC, WPAFB, OH

#### 3:00 p.m. Carbon Nanotube – Polymer Composites: A Study on Electrical Conductivity

L. Peña-Paras, D. Chakravarthi, V. Khabashesku, E.V. Barrera, Q. Zeng, Rice University, Houston, TX; K. Lozano, University of Texas Pan American, Edinburg, TX; R. Vaidyanathan, C. Bisch, Advanced Ceramics Research, Tucson, AZ

#### 3:30 p.m. Nano Structure and Electrical Properties of MWNT and Nanofiber Film Materials

C.-S. Yeh, Y. Xue, C.-Y. Lin, Z. Liang, B. Wang, C. Zhang, Florida State University, Tallahassee, FL

#### 4:00 p.m. Synthesis and Characterization of Nylon 6,10 Nanocomposites Containing Functionalized Single-walled Carbon Nanotubes

M. Moniruzzaman, K.I. Winey, University of Pennsylvania, Philadelphia, PA; J. Chattopadhyay, W.E. Billups, Rice University, Houston, TX

# Wednesday, November 8<sup>th</sup>

## State Room

### Fire Safe Materials Part 2 - Session

Chairs: Alexander B. Morgan, University of Dayton Research Institute, Dayton, OH and Anteneh Z. Worku, Dow Chemical, Midland, MI

#### 1:00 p.m. Flame Retarded Thermoplastic and Thermoset Materials Based on Phosphorus Chemistry

M. Dietz, W. Wanzke, Clariant Produkte GmbH, Bayern, Germany

#### 1:30 p.m. Loss of Balsa Wood Core Structural Integrity During Fire Exposure of Sandwich Composites

C.A. Ulven, J. Mosbrucker, B. Miller, North Dakota State University, Fargo, ND; U.K. Vaidya, S. Vaddi, S. Pillay, University of Alabama at Birmingham, Birmingham, AL

#### 2:00 p.m. Flammability, Mechanical, and Thermal Properties of Polyamide Nanocomposites

J.H. Koo, S. Lao, W. Ho, K. Nguyen, J. Cheng, University of Texas at Austin, Austin, TX; L. Pilato, G. Wissler, M. Ervin, KAI, Inc., Austin, TX

#### 2:30 p.m. Properties and Flammability of Polycarbonate/Inorganic Nanocomposites Prepared via Extrusion

F. Yang, I. Bogdanova, G.L. Nelson, Florida Institute of Technology, Melbourne, FL

#### 3:00 p.m. Effect of Fibre Type on Fire and Mechanical Behaviour of Hybrid Composite Laminate

B.K. Kandola, P. Myler, A.R. Horrocks, K. Herbert, M.R. Rashid, University of Bolton, Bolton, UK

#### 3:30 p.m. Modeling of Large-Scale Fire Test Performance of Glassfiber-reinforced Composite

J. Huczek, M. Janssens, Southwest Research Institute®, San Antonio, TX

## Continental Room

### Adhesives, Joining and Bonding - Session

Chairs: James Mazza, AFRL, WPAFB, OH and Kay Blohowiak, The Boeing Company, Seattle, WA

#### 1:00 p.m. The Evaluation of Low-Temperature Alternate Cure Cycles for 121°C (250°F)-Curing Epoxy Structural Film Adhesives

D.B. McCray, J.A. Smith, University of Dayton Research Institute, Dayton, OH; B.A. Bolan, AFRL/MLSA, WPAFB, OH

#### 1:30 p.m. High-Temperature Adhesive Development

R.A. Gray, J.R. Magato, R. Vannucci, Maverick Corporation, Blue Ash, OH; G. Dillingham, Brighton Technologies Group, Cincinnati, OH

#### 2:00 p.m. Atmospheric Plasma Treatment of Polyetheretherketone Composites for Improved Adhesion

R.F. Hicks, S.E. Babayan, J. Penelon, Q. Truong, D.S.F. Cheng, V.V. Le, J. Ghilarducci, A.G. Hsieh, Surfex Technologies LLC, Culver City, CA; J.M. Deitzel, J.W. Gillespie, Jr., University of Delaware, Newark, DE

## 1:00 p.m. Oral Presentation Only

### Far East Room

#### Special Seminar Offering

### High Temperature Composite Market Overview

Seminar Leaders: Scott W. Beckwith, SAMPE Technical Director and BTG Composites Inc., Salt Lake City, UT and Christopher Red, Composite Market Reports, Gilbert, AZ

This special seminar offering is being made to address the increased interest in high temperature materials and high temperature composite structures applications. A market study was recently completed that focused on the advances made in high temperature materials and the study looked at various potential market segment applications. The results of the study will present the range of material costs for a number of traditional and upcoming material systems in comparison with aluminum, titanium, and aluminum lithium materials. Processes typically using high temperature materials for manufacturing composite structures will be presented, along with market projections for the period 2005 through 2012. Typical applications will be discussed for these materials. Attendees to this seminar will receive a copy of the study materials on a CD because the material will not be in the formal SAMPE conference proceedings. NOTE: Admittance to this special seminar is free to those who will have registered for at least one day of the conference or one of the tutorials offered by SAMPE on Monday, November 6<sup>th</sup>.

## Continental Room

### Sandwich/Marine/Transportation - Session

Chair: Russell Elkin, Alcan Baltek Corporation, Northvale, NJ

#### 3:30 p.m. Investigation of Moisture Ingress and Migration Mechanisms of an Aircraft Rudder Composites Sandwich Structure

C. Li, National Research Council of Canada, Ontario, Canada; J. Teuwen, Delft University of Technology, Delft, The Netherlands; V. Lefebvre, Department of National Defence Canada, Ottawa, Canada

#### 4:00 p.m. Numerical Techniques in the Simulation of Energy Absorbing Materials in Blast Loaded Structures

U. Sakaray, B.J. O'Toole, J. Thota, University of Nevada, Las Vegas, NV

#### 4:30 p.m. TuffFoam™: A TDI-Free Water Blown Polyurethane Foam

L. Whinnery, S. Goods, P. Keifer, Sandia National Laboratories, Livermore, CA

## 6:00 p.m. - 9:00 p.m.

### SAMPE Night at Gilley's

Dig out that Stetson. Shine those boots. Get ready for your mechanical bull ride. Tonight, we're going to Gilley's. Mingle with your SAMPE colleagues, shoot a game of pool or try your hand at the arcade games while enjoying a traditional Texas BBQ. Shuttle service will be provided to and from the Fairmont Hotel. Buses will load on Ross Street; South tower lobby. Extra tickets can be purchased at the registration desk for \$35.





## Continental Room

### Aircraft Materials Recycling - Session

Chairs: William Carberry and Peter George, The Boeing Company, Seattle, WA

#### 8:00 a.m. Alignment of Recycled Carbon Fibre and its Application as a Reinforcement

G.Z. Jiang, K.H. Wong, S.J. Pickering, G.S. Walker, C.D. Rudd, University of Nottingham, Nottingham, UK

#### 8:30 a.m. Characterisation of Recycled Carbon Fibre: Mechanical Properties and Surface Chemistry

K.H. Wong, G.Z. Jiang, S.J. Pickering, C.D. Rudd, G.S. Walker, University of Nottingham, Nottingham, UK

#### 9:00 a.m. Integrated Composite Recycling Process

J.M. Gosau, R.E. Allred, T.F. Wesley, Adherent Technologies, Inc., Albuquerque, NM

#### 9:30 a.m. Recycled Carbon Fiber Analysis: Morphological and Chemical Characterization

M. Connor, B. Allen, J. Heil, J. Cuomo, North Carolina State University, Raleigh, NC; P.E. George, W.L. Carberry, The Boeing Company, Seattle, WA

#### 10:00 a.m. Recycled Carbon Fiber Analysis: Mechanical Properties

M. Connor, B. Allen, J. Heil, J. Cuomo, North Carolina State University, Raleigh, NC; P.E. George, W.L. Carberry, The Boeing Company, Seattle, WA

#### 10:30 a.m. Moulding Compound Development Using Recycled Carbon Fibres

S.J. Pickering, T.A. Turner, N.A. Warrior, University of Nottingham, Nottingham, UK

## Parisian Room

### Nanomaterials/Nanocomposites Part 3 - Session

Chairs: Joseph Koo, University of Texas at Austin, Austin, TX and M. Jason Adams, Lockheed Martin, Fort Worth, TX

#### 8:00 a.m. Development of Electronically Conductive PTFE Composite by Adding Carbon Nanofillers

J. Ren, Performance Plastics Products, Houston, TX

#### 8:30 a.m. Interfacial Strength and Physical Properties of Functionalized Graphene - Epoxy Nanocomposites

S.G. Miller, NASA Glenn Research Center, Cleveland, OH; P. Heimann, Ohio Aerospace Institute, Cleveland, OH; D. Scheiman, QSS, Cleveland, OH; D.H. Adamson, I.A. Aksay, R.K. Prud'homme, Princeton University, Princeton, NJ

#### 9:00 a.m. Aligned Carbon Nanotube to Enhance Through Thickness Thermal Conductivity in Adhesive Joints

S. Ganguli, University of Dayton Research Institute, Dayton, OH; A.K. Roy, Air Force Research Laboratory, WPAFB, OH

#### 9:30 a.m. Cyanate Ester-silicon Carbide Nanocomposites: Processing and Characterization

J. H. Koo, S. Lao, J. Yong, The University of Texas at Austin, Austin, TX; G. Wissler, L. Pilato, KAI, Inc., Austin, TX; Z.P. Luo, Texas A&M University, College Station, TX

#### 10:00 a.m. Outstanding Paper Award 2<sup>nd</sup> Place-Improving Interfacial Bonding and Load-Transfer in Nanocomposite Through Grafting Diethyltoluenediamines on SWNTs

S. Wang, Z. Liang, B. Wang, C. Zhang, Florida State University, Tallahassee, FL; T. Liu, Univ of British Columbia, Vancouver, Canada

## State Room

### Metal, Metal Matrix Composites & Thermal Management - Session

Chairs: Gerald C. Maxwell, NASA; Carl Zweben, Composites Consultant, Devon, PA; and Warren H. Hunt, Jr., TMS, Warrendale, PA

#### 8:00 a.m. Modeling of Particle Reinforced Metal Matrix Composites Using Actual Microstructures

N. Chawla, Arizona State University, Tempe, AZ; K.K. Chawla, University of Alabama at Birmingham, Birmingham, AL

#### 8:30 a.m. Synthesis and Applications of Cast Metal Matrix Composites and Syntactic Foams

N. Gupta, Polytechnic University, Brooklyn, NY; P.K. Rohatgi, University of Wisconsin, Milwaukee, WI; D. Weiss, ECK Industries, Inc., Manitowoc, WI; D. Miracle, AFRL, WPAFB, OH

#### 9:00 a.m. The Role of Nanotubes in Melt-Processed, Single-walled Nanotube Reinforced Titanium Metal Matrix Composites

K. Wilson, Y. Bayazitoglu, E.V. Barrera, Rice University, Houston, TX

#### 9:30 a.m. Transition Potentials of Light Weight Composite Aircraft & Spacecraft Thermal Management Components

R.J. Watts, J. Arnold, G. Maxwell, R. Hall, B. Pesta, Air Force Research Laboratory, Wright-Patterson AFB, OH

#### 10:00 a.m. Temperature and Silicone Content Effects on Tensile Deformation of T91 Grade Steel

P. Kumar, D. Maitra, A.K. Roy, Univ of Nevada/Las Vegas, Las Vegas, NV

## Oak Room

### Composites Repair, Testing and Inspection Technologies - Session

Chairs: Dan Greene, Chattahoochee Specialty Composites, Roswell, GA and Valery Godinez, Physical Acoustics Corp., Princeton Junction, NJ

#### 8:00 a.m. Experimental Simulation of Rain and Wind for RF Measurement of Radomes

W. Strauss, D. Satterfield, Raytheon Advanced Products Center, McKinney, TX

#### 8:30 p.m. Damage Tolerance and Durability of High Modulus Graphite/Epoxy Composite Laminates

K.S. Raju, Wichita State University, Wichita, KS; E. Dan-Jumbo, Northrop Grumman Corporation, San Diego, CA

#### 9:00 a.m. Characterization of Thermally Conductive Elastomer/Carbon Composites

L.D. Peel, V.V. Gudge, Texas A&M University - Kingsville, Kingsville, TX; E. Marotta, C. Silva, Texas A&M University, College Station, TX

#### 9:30 a.m. Dynamic Mechanical Behavior of Epoxy - Porous Silica Composites

N.A. D'Souza, Z. Yang, University of North Texas, Denton, TX; D. Coutinho, K.J. Balkus, Jr., University of Texas at Dallas, Richardson, TX

#### 10:00 a.m. Strategies for Refurbishing Aging Bonded Aircraft Components

J. McDaniel, USAF/DoD, Ogden, UT



**1:00 p.m. Oral Presentations Only**

*Oak Room*

Special Seminar Offering

## **Sandwich and Core Technology: Overview and Applications Update**

Seminar Leader: Scott W. Beckwith, SAMPE Technical Director and BTG Composites Inc., Salt Lake City, UT

This special seminar will consist of an introductory workshop on sandwich and core technology as it pertains to designing and manufacturing composite structures using these materials. Following the introductory presentation using Power Point lecture slides, the remainder of this seminar will consist of various presentations made by industry manufacturers of various foam, honeycomb and structural foam materials. These materials are widely used across a number of the aerospace and commercial market segments. Invited speakers from representatives of closed cell, open cell, honeycomb and hybrid core material systems will be available to discuss the latest applications. Invited vendor presentations are:

- Alcan Baltek Corporation
- Bryte/Ten Cate
- DIAB Inc.
- Euro-Composites Corp.
- General Plastics Manufacturing Company
- Inspect Foams Inc. (ROHACELL Rohm GmbH)
- Webcore Technologies
- YLA Advanced Composites

A CD ROM will be available for attendees for the technology overview portion of this seminar.

NOTE: Admittance to this special seminar is free to those who will have registered for at least one day of the conference or one of the tutorials offered by SAMPE on Monday, November 6<sup>th</sup>.

*Continental Room*

## **High Temperature Materials - Session**

Chairs: Katie Thorp, AFRL, WPAFB, OH, Charlie Watson, Pratt & Whitney, and Thao Gibson, University of Dayton Research Institute, Dayton, OH

### **1:00 p.m. Nanomechanical Characterization of Isothermally Aged AFR-PE-4 Resin**

S. Putthanasarat, G.P. Tandon, University of Dayton Research Institute, Dayton, OH; G.A. Schoepner, Air Force Research Laboratory/MLBC, WPAFB, OH

ITAR

### **1:30 p.m. Advanced High Temperature Airframe Developments on the NATO Evolved SeaSparrow Missile**

M. Platero, A. Facciano, J. Diaz, D. Chasman, Raytheon Missile Systems, Tucson, AZ

ITAR

### **2:00 p.m. Advanced Integral High Temperature Airframe and Propulsion Developmental Concepts for the NATO Evolved SeaSparrow Missile**

M. Platero, A. Facciano, J. Diaz, D. Chasman, Raytheon Missile Systems, Tucson, AZ

ITAR

### **2:30 p.m. Structure-Property Relations for Siloxane Modified Polyimide Composites**

Y. Li, F. Tschen, R.J. Morgan, Texas A&M University, College Station, TX; J.E. Lincoln, Performance Polymer Solution Inc., Centerville, OH

### **3:00 p.m. Evaporative Cooling of Moisture Bearing Epoxy Composite Plates**

Yuntao Li, G.S. Payette, N. Obando, J. O'Neal, J. Ju, R.J. Morgan, J.N. Reddy, Texas A&M University, College Station, TX

### **3:30 p.m. Effects of Storage Aging on the Cure Kinetics of T700/BMI Prepregs**

Z.-S. Guo, Shanghai Institute of Applied Mathematics and Mechanics, Shanghai University, Shanghai, China; S.-Y. Du, B. Zhang, Harbin Institute of Technology, Harbin, China

*Parisian Room*

## **Nanomaterials for Space Applications - Session**

Chair: Ed Silverman, Northrop Grumman, Redondo Beach, CA

### **1:00 p.m. High Temperature Nano-Composites for Aerospace Applications**

R. Vaidyanathan, C. Bisch, J. Campbell, B. Williams, M. Stoltenberg, Advanced Ceramics Research, Inc., Tucson, AZ; D. Chakravarti, Q. Zeng, E.V. Barrera, Rice University, Houston, TX; S. Yarlagadda, University of Delaware, Newark, DE; K. Lozano, University of Texas-Pan American, Edinburg, TX

ITAR

### **1:30 p.m. EMI Shielding Polymers Based on Carbon Nanotube Hybrids**

T. Tiano, T. Phely-Bobin, A. Lynch, C. Carey, Foster-Miller, Inc., Waltham, MA; D. Hess, J. Marchand, ARC Technologies, Inc., Amesbury, MA; R. Czerw, NanoTech Labs, Yadkinville, NC

### **2:00 p.m. Surface Modification of Exfoliated Graphite Nano-Reinforcements**

R.E. Allred, J.-M. Gosau, J.P. Barlow, Adherent Technologies, Inc., Albuquerque, NM

### **2:30 p.m. Evaluation of Carbon Nanofiber-Based Coatings and Adhesives**

S.P. Rawal, F.M. Kustas, Lockheed Martin Space Systems Company, Denver, CO; B.P. Rice, University of Dayton Research Institute, Dayton, OH

**1:00 p.m.**

## **Bell Helicopter Plant Tour**

ITAR

Join us on Thursday afternoon, November 9, 2006 for an exclusive tour of the Composite Development Center at Bell Helicopters in Hurst, Texas. This unprecedented tour will take you behind the scenes of one of the most advanced automated composites manufacturing centers in the world. Register early for the conference and insure yourself a place on the tour. The shuttle bus will pick you up in front of the Fairmont Hotel at 1:00 p.m. sharp to travel to the facility. You are expected to be back at the hotel by 4:30 p.m.

### **IMPORTANT:**

1. Because of the advanced nature of the technologies that will be demonstrated, this tour is ITAR RESTRICTED. (See page 8 for ITAR information).

We must take these steps in order to properly comply with federal ITAR regulations. There can be no exceptions.

2. Space is limited to the first 45 people with ITAR clearance.

3. To take this tour, you must ride the SAMPE bus. No individual vehicles are allowed.

Any questions? Call Priscilla at 626.331.0616, ext 610.

# Call for Papers

## SAMPE Fall Technical Conference

October 29-November 1, 2007

Cincinnati Hilton Netherlands Plaza



## “From Art to Science: Advancing Materials & Process Engineering”



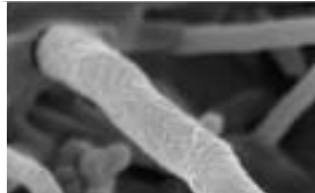
Sponsored by the SAMPE Midwest Chapter

We are seeking high quality technical papers that focus on Materials and Process (M&P), Research, Development, Applications and Engineering.

### Major Themes



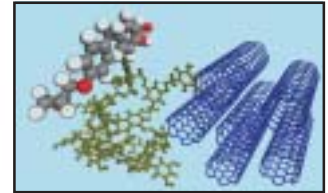
Morphing & Adaptive  
Materials



Nanomaterials



Propulsion Materials



Computational Material  
Science

### Other Areas Sought:

Adhesive Bonding  
Air Breathing & Rocket  
Alternative Energy Materials  
Anti-Terrorism Technology  
Art Restoration  
“Art to Science” NSF R&D  
Automotive Applications  
Ceramics & Ceramic Composites  
Coatings & Sealants  
Coatings for Durability  
Composite Design & Analysis  
Composites  
Composites Repair Technology  
E-Beam Processing  
Electrical Properties of  
Composites  
Electroactive Polymers  
Electronic Materials  
Emerging Materials  
Environment & Recycling

Failure Analysis & Risk  
Management  
Fiber Sizing Technology  
Fiber Tape Placement  
Fibers & Textiles  
Fire Protection  
Fire Safety/Materials  
Technology  
Foams  
Fuel Cell Materials  
Global Standardization of  
Materials and Testing  
“Health” Monitoring  
High Temperature  
High Temperature Resins  
High Thermal Conductivity  
Materials  
Infrastructure Applications &  
Trends  
Lean Manufacturing

Liquid Molding (VARTM, RTM)  
Marine Applications  
Materials & Alloys  
Materials & Processing  
Materials & Technology for  
Renewable Energy Sources  
Materials R&D  
Metals & Alloys  
Metals & Metal Composites  
Nano-Materials  
Natural Fibers  
New Global Markets  
Next Generation Composite  
Structures  
Nondestructive Evaluation  
Nonmetallics  
Offshore Applications  
Payload Fairings for Launch  
Vehicles  
Preforms Technologies

Processing Advances  
Propulsion Materials  
Reinforcements  
Renewable Energy Sources  
Repair  
Resin Development  
RTM/VARTM/SCRIMP  
Sandwich Structures  
Smart & Multi-Functional  
Materials  
Space/Access to Space (TPS)  
Space Structures  
Supply Chain Management  
Test, Inspection & Evaluation  
Textile Processing  
2D & 3D Textiles  
Tooling  
Thermal Management  
UCAV & UAV Technology  
Wind Energy

Present your technical paper at the SAMPE Fall Technical Conference in Cincinnati, OH. To assess your proposed technical paper and presentation, send us an abstract that gives the objective, results, and significance of your study. If your abstract is accepted, SAMPE Headquarters will provide instructions regarding paper preparation. Acceptance of your abstract does not constitute acceptance of the paper. The 100-200 word abstracts need to be submitted online by April 2007. Visit [www.sampe.org](http://www.sampe.org) for more details.

SAMPE is also accepting restricted papers established by the U.S. ITAR (United States International Traffic in Arms Regulations). Prospective authors should submit the unrestricted abstract through the SAMPE website for evaluation and selection.

### Abstract Submission Questions

Michelle Loggia, SAMPE

626.331.0616, ext. 603 • Email: [michelle@sampe.org](mailto:michelle@sampe.org)

### Technical Program Questions

Don Klosterman, University of Dayton

937.469.1811 • Email: [donald.klosterman@udri.udayton.edu](mailto:donald.klosterman@udri.udayton.edu)

Go to [www.sampe.org](http://www.sampe.org) for an abstract submittal form!

# General Information

## Registration Hours

Monday, November 6	7:00 a.m. – 5:00 p.m.
Tuesday, November 7	7:00 a.m. – 5:00 p.m.
Wednesday, November 8	7:00 a.m. – 4:30 p.m.
Thursday, November 9	7:30 a.m. – 2:30 p.m.

## Exhibit Hours

Tuesday, November 7	10:00 a.m. – 4:00 p.m.
Wednesday, November 8	10:00 a.m. – 4:00 p.m.

Exhibits are closed on Monday and Thursday and are located in the Regency Ballroom of the Fairmont Hotel.

## On-site Registration

Do not fill out the pre-registration form that is in the Preliminary Program. You must fill out an on-site registration form when you are ready to register.

Payment in full must be made at the time of registration.

Acceptable forms of payment are cash, check, VISA, MasterCard, or American Express.

## Cancellation/Refund/Substitution Policy

No refund will be given for failure to attend, late arrival, unattended events or early departure from the meeting. Refund requests must be in writing in advance of the show according to the refund guidelines. Refunds are processed after the conference. There is no charge for making a substitution. The appropriate member/non-member rate will apply to the attending substitute.

## Exhibits Hall Admission

ALL MUST REGISTER AND BE BADGED TO ENTER THE EXHIBIT HALL. Conference registrants are automatically admitted to the exhibits with their badges. Complimentary Pass holders must register to get a badge to enter. Anyone not registered or not having a Complimentary Pass must pay a \$50 admission fee. This fee allows the attendee into the exhibit area on both days of the exhibition.

All registrations will be handled at the SAMPE registration area.

## For Further Information Contact:

SAMPE  
1161 Park View Drive, Suite 200, Covina, CA 91724-3751  
Phone: 800.562.7360 • Fax: 626.332.8929  
Website: [www.sampe.org](http://www.sampe.org)

Registration: Priscilla Heredia, ext. 610  
Email: [priscilla@sampe.org](mailto:priscilla@sampe.org)

Exhibits: Karen Chapman, ext. 616  
E-Mail: [karen@sampe.org](mailto:karen@sampe.org)

Membership: Patricia Padelford, ext. 632  
E-Mail: [particia@sampe.org](mailto:particia@sampe.org)

## Session Chairs and Speaker Orientation in the Board Room

Please attend the short orientation meeting at 7:00 a.m. (for morning sessions) or 11:00 a.m. (for afternoon sessions) on the day of your presentation. This will provide you with the opportunity to meet the other session participants, coordinate with your session chair, arrange for pre-loading of your presentation, (if it was not sent to your chair before the conference), and also hear announcements from the technical program chair.

## Volunteer Center-Director's Room

Check in here for your assignment and instructions.

## Bell Helicopter Plant Tour Thursday, November 9

Bus begins loading at 12:30 p.m. in front of the Fairmont Hotel. Departure time is 1:00 p.m. sharp. ITAR clearance required.

## Virtual Career Fair – Online

October 23 – November 10, 2006

We are pleased to announce the upcoming SAMPE Virtual Career Fair, to be held in conjunction with the SAMPE Fall Technical Conference. This Career Fair will be held on the Aeroindustryjobs website, so there is no need to be present at the SAMPE conference to participate. Job seekers are invited to post resumes and hiring companies are invited to post jobs, all free of charge. To participate, visit [www.aeroindustryjobs.com](http://www.aeroindustryjobs.com), and click the "Career Events" link where you will find a link to the SAMPE event.

## Mute That Phone!

As a courtesy to all presenters/panels/tutorials, it is requested that all cell phones be muted during all presentations. We appreciate your cooperation.

## SAMPE Europe

Conferences: Mark Erath  
Ph: +41 61 601 87 71  
Fx: +41 61 601 81 28  
[erath@bluewin.ch](mailto:erath@bluewin.ch)

Membership: Heidi Mueller  
Ph: +41 52 319 31 43  
Fx: +41 52 319 26 25  
[hm8461@bluewin.ch](mailto:hm8461@bluewin.ch)

## SAMPE Japan

Yoshinori Matsuoka  
Ph: 81-467-24-2721  
Fx: 81-467-24-2735  
[sampejp@fsinet.or.jp](mailto:sampejp@fsinet.or.jp)



# Show Floor

Exhibit Schedule

Tuesday, November 7 • 10:00 a.m. - 4:00 p.m.

Wednesday, November 8 • 10:00 a.m. - 4:00 p.m.

Regency Ballroom Fairmont Hotel





## Exhibitor Alphabetical Listing and Booth Number

3M	131	EDO Corporation	130	Myers Engineering	T28
3TEX, Inc.	105	EEONYX Corporation	T6	National Refrigeration Company	136
ABAQUS	129	Entec Composite Machines	T21	Noran Engineering, Inc.	T36
Advanced Composites Group (ACG)	T43	E.T. Horn Company	T35	Physical Acoustic Corporation	T31
Air Force Research Laboratory/ML		Euro-Composites Corp.	T30	Plasma Technology Systems	127
	116 & 117	Fatigue Technology Inc.	123	Quartus Engineering, Inc.	T7
Airtech International	151 & T29	Flow International	133	Quickstep Technologies	102
Albany Engineered Composites	101	Formglas, Inc.	T32	Reinhold Industries, Inc.	145
Alcan Baltek Corporation	T24	General Magnaplate	143	Reno Machines	126
Anchor Autoclave Systems	T45	General Plastics Mfg. Co	138	Richmond Aircraft Products	115
Applied Aerospace Structures Corp.	T44	Graco Supply Company	T47	SAMPE	113
Applied Nanotech, Inc.	T37	GSG, Inc.	T20	Taricco Corp.	T2
Applied Sciences, Inc.	128	HEATCON Composite Systems	T22	Technical Fibre Products, Inc.	T8
ASC Process Systems	T13	Helicomb International	139	Textile Products, Inc.	T48
Assembly Guidance	111	Henkel Corp.	135	Tinius Olsen	T1
AvPro, Inc.	T46	High Performance Composites	T38	Toho Tenax America	T27
Bryte/TenCate	150	HITCO	134	Trelleborg Emerson & Cuming	T17
Burnham Composites, Inc.	107	Huntsman Advanced Materials	132	Triumph Fabrications-Ft. Worth	110
Canyon Composites	T18	Inspec Foams, Inc. - ROHACELL,		UCI-Raptor	T4
Carl Zeiss Microlmaging, Inc.	154	Rohm GmbH	103	US Civilian Research & Development	
CMC Interconnect Technologies	T15	Integran Technologies	T33	Foundation (CRDF)	140
Composites One	T23	JPS Composite Materials, Inc.	T26	V2 Composites	T9
Cytec Engineered Materials	155	Krayden, Inc.	T16	Virtek Vision International	125
DeComp Composites, Inc.	108	LAP Laser, LLC	T34	Vistagy, Inc.	106
DIAB, Inc.	104	Lucas Industries	T5	Webcore Technologies	T3
Diamond Fiber Composites	T14	Matec Instrument Companies, Inc.	T12	YLA Advanced Composites	T25
Dynamold, Inc.	T11	Maverick Corporation	T19		

## Exhibitor Numerical Listing and Booth Number

Albany Engineered Composites	101	Helicomb International	139	HEATCON Composite Systems	T22
Quickstep Technologies	102	US Civilian Research & Development		Composites One	T23
Inspec Foams, Inc. -ROHACELL,		Foundation (CRDF)	140	Alcan Baltek Corporation	T24
Rohm GmbH	103	General Magnaplate	143	YLA Advanced Composites	T25
DIAB, Inc.	104	Reinhold Industries, Inc.	145	JPS Composite Materials, Inc.	T26
3TEX, Inc.	105	Bryte/TenCate	150	Toho Tenax America	T27
Vistagy, Inc.	106	Airtech International	151 & T29	Myers Engineering	T28
Burnham Composites, Inc.	107	Carl Zeiss Microlmaging, Inc.	154	Euro-Composites Corp.	T30
DeComp Composites, Inc.	108	Cytec Engineered Materials	155	Physical Acoustic Corporation	T31
Triumph Fabrications-Ft. Worth	110	Tinius Olsen	T1	Formglas, Inc.	T32
Assembly Guidance	111	Taricco Corp.	T2	Integran Technologies	T33
SAMPE	113	Webcore Technologies	T3	LAP Laser, LLC	T34
Richmond Aircraft Products	115	UCI-Raptor	T4	E.T. Horn Company	T35
Air Force Research Laboratory/ML		Lucas Industries	T5	Noran Engineering, Inc.	T36
	116 & 117	EEONYX Corporation	T6	Applied Nanotech, Inc.	T37
Fatigue Technology Inc.	123	Quartus Engineering, Inc.	T7	High Performance Composites	T38
Virtek Vision International	125	Technical Fibre Products, Inc.	T8	Advanced Composites Group (ACG)	T43
Reno Machines	126	V2 Composites	T9	Applied Aerospace Structures Corp.	T44
Plasma Technology Systems	127	Dynamold, Inc.	T11	Anchor Autoclave Systems	T45
Applied Sciences, Inc.	128	Matec Instrument Companies, Inc.	T12	AvPro, Inc.	T46
ABAQUS	129	ASC Process Systems	T13	Graco Supply Company	T47
EDO Corporation	130	Diamond Fiber Composites	T14	Textile Products, Inc.	T48
3M	131	CMC Interconnect Technologies	T15		
Huntsman Advanced Materials	132	Krayden, Inc.	T16		
Flow International	133	Trelleborg Emerson & Cuming	T17		
HITCO	134	Canyon Composites	T18		
Henkel Corp.	135	Maverick Corporation	T19		
National Refrigeration Company	136	GSG, Inc.	T20		
General Plastics Mfg. Co	138	Entec Composite Machines	T21		



# Exhibitor's Products and Services Listing

**3M Company**  
**3M Center, Bldg. 223-1N-14**  
**St. Paul, MN 55144**  
[www.3M.com/aerospace](http://www.3M.com/aerospace)

3M is a leading supplier to the global aerospace industry, providing innovative products and solutions to OEMs and MROs in the commercial, business, general, and military aviation industries. 3M has more than 30 major technology and product platforms, as well as technical support, sales and distribution networks that can help industry leaders stay competitive. 3M products include adhesives and tapes; abrasives; electronic materials and equipment; supply-chain software and services; primers and coatings; protective, decorative and reflective films and thousands of other ways to make aerospace operations more effective, profitable, safe and efficient.

**3TEX, Inc.**  
**109 MacKenan Drive**  
**Cary, NC 27511**  
[www.3TEX.com](http://www.3TEX.com)

3TEX researches, develops, manufactures, and sells three-dimensional composite reinforcements. 3TEX makes use of high tech fibers to create products used in an array of industries including marine, industrial, and military applications. The company's products include both three dimensional woven and braided materials, marketed under the trade names 3WEAVE® and 3BRAID®

**ABAQUS, Inc.**  
**Rising Sun Mills**  
**166 Valley Street**  
**Providence, RI 02909-2499**  
[www.abaqus.com](http://www.abaqus.com)

ABAQUS Finite Element Analysis software products provide the best-in-class software solutions for non-linear structural mechanics simulations to customers around the world. ABAQUS also provides world-class pre and post-processing in our CAE modeling environment to bring the sophistication of ABAQUS FEA solutions to the engineers desktop environment.

**Advanced Composites Group, The**  
**5350 S. 129<sup>th</sup> E Avenue**  
**Tulsa, OK 74134**  
[www.advanced-composites.com](http://www.advanced-composites.com)

The Advanced Composites Group (ACG) provides a unique combination of products and services globally. ACG specializes in the manufacture of high-performance composite prepregs and materials, into a diverse range of applications and markets.

Including: aerospace, commercial aircraft, launch vehicles, motorsport, marine, automotive, leisure sports, and a key supplier of tooling materials to the industry. ACG is a division of UMECO.

**Albany Engineered Composites**  
**112 Airport Drive**  
**Rochester, NH 03867**  
[www.albint.com/aec](http://www.albint.com/aec)

Design, develop and manufacture engineered textile products and composites. Products include: engineered fabrics/tapes, shape/conformable woven fabrics, biaxial, triaxial/3D braids, hi-temp braided seals, 3D woven preforms, integrated perform assemblies, RTM and VaRTM composites, Z-Fiber, X-Cor and K-Cor.



**131 Air Force Research Laboratory/ML 116 & 117**  
**2079 Tenth Street, Bldg. 255, Area B**  
**Wright Patterson AFB, OH 45443**

Materials and Manufacturing Directorate, headquartered at Wright-Patterson Air Force Base, with an additional research facility at Tyndall AFB, Fla., develops materials, processes and advanced manufacturing technologies for aircraft, spacecraft, missiles, rockets and ground-based systems and their structural, electronic and optical components. Their research includes revolutionary nano-scale and biotechnologies, as well as non-structural materials such as coatings, fluids and greases. Air Force product centers, logistics centers and operating commands rely on the directorate's expertise in metallic and nonmetallic structural materials, nondestructive inspection; materials used in aerospace propulsion systems, sensor materials, laser-hardened materials, systems support and advanced manufacturing methods to solve system, expeditionary deployment, and operational challenges.

**105 Airtech International, Inc. 151 & T29**  
**5100 Skylab Road**  
**Huntington Beach, CA 92647**  
[www.airtechonline.com](http://www.airtechonline.com)

Airtech Advanced Materials Group manufactures vacuum bagging and composite tooling materials for resin infusion, hand lay-up, and oven/autoclave cures up to 750°F. See our two new tooling systems: Toolfusion® - Epoxy resin infusion resins and Toolmaster® - CEP - Cyanate/Epoxy prepreg stable to 450°F for BMI, Cyanate Ester, and other high temperature cures, and extended tool life. We have a new state of the art patented vacuum line system: The Premier Line. Airtech - local technical help and service worldwide.



**Alcan Baltek Corporation**  
**108 Fairway Court**  
**Northvale, NJ 07647**  
[www.sales@alcanbaltek.com](http://www.sales@alcanbaltek.com)

Alcan Baltek Corporation, a member of the Alcan Composites Group, is a worldwide supplier of structural core materials for today's composite market. Alcan Baltek offers an extensive array of products including BALTEK® balsa and the new BALTEK® Gold, AIREX® C70 and C71 PVC foam cores, AIREX T90 and T91 PET foam foams, LANTOR® non-woven mats, and SORIC infusion medium and thin cores. Alcan Baltek also offers excellent customer technical service, and ISO9001:2000 quality assurance.

**Anchor Autoclave Systems**  
**P.O. Box 19932**  
**Houston, TX 77224**  
[www.anchorautoclave.com](http://www.anchorautoclave.com)

For the past twenty years, Anchor Autoclave Systems has designed and manufactured a complete line of autoclaves, control systems, and track and cart assemblies for the composite industry. We also provide boilers, consulting, and on going technical support and parts replacement.

**Applied Aerospace Structures Corp.**  
**3437 S. Airport Way/R.O. Box 6189**  
**Stockton, CA 95206**  
[www.aascworld.com](http://www.aascworld.com)

AASC fabricates on a build-to-print or design to specification complex composite and metal bonded structures and assemblies for both military and commercial applications. AASC is classified as a small business. The company is ISO 9001:2000 and AS9100, third party certified and has been in business since 1956.

# Exhibitor's Products and Services Listing

**Applied Nanotech, Inc.**  
**3006 Longhorn Blvd., Ste. 107**  
**Austin, TX 78758**  
**[www.nano-proprietary.com](http://www.nano-proprietary.com)**

Applied Nanotech Inc. (ANI) offers improved nanocomposites that exhibit high strength and toughness, greater impact strength and improvements in other physical properties using dispersions of nanomaterials such as carbon nanotubes and nanoclays. ANI has developed nanocomposites with superior properties using Nylon 6, Nylon 66, Nylon 11, Epoxies and other polymer materials.

**Applied Sciences, Inc. (ASI)**  
**141 West Xenia Avenue**  
**Cedarville, OH 45314-0579**  
**[www.apsci.com](http://www.apsci.com)**

Applied Sciences, Inc. (ASI) develops innovative carbon materials and their applications for various commercial and military customers. ASI's manufacturing affiliate, Pyrograf Products, Inc. (PPI), is one of the world's leading producers of high-quality, affordable, multi-functional carbon nanofibers. Products include Pyrograf-III-a vapor-grown carbon nanofiber which can be added to composite materials to enhance the host materials' strength, stiffness, and electrical conductivity. Current production capacity is 70,000 lbs/year; and expansion plans are under development.

**ASC Process Systems**  
**14062 Balboa Blvd.**  
**Sylmar, CA 91341**  
**[www.aschome.com](http://www.aschome.com)**

ASC Process Systems is the largest supplier of autoclaves, and control software in North America producing over 25 systems per year. ASC offers a line of standard Econoclave's™, as well as custom equipment to meet or exceed your application. Over the last year ASC has provided systems from 1'X2' to the largest autoclave in the world at 30'X75'. No project is too large or small. ASC's CPC™ control package has become the industry standard, controlling over 1,200 pieces of equipment worldwide.

**Assembly Guidance Systems, Inc.**  
**27 Industrial Avenue**  
**Chelmsford, MA 01824**  
**[www.assemblyguide.com](http://www.assemblyguide.com)**

Multitasking 3D laser projectors accurately display CAD data for manual tasks directly onto 3D surface. Options: compact size, wireless, targetless, PDA remotes. LASERGUIDE eliminates templates and provides non-contaminating dimensional information for faster and better assemblies. Automatic Ply Verification (APV) verifies and documents that every ply is build correctly every time.

**AvPro, Inc.**  
**P.O. Box 1696**  
**Norman, OK 73070**  
**[www.alongbrake@avproinc.com](mailto:www.alongbrake@avproinc.com)**  
**[www.avproinc.com](http://www.avproinc.com)**

AvPro provides software tools control systems and testing services for characterizing and managing the processing of composites and other materials. Products include the PACE2000 testing systems to monitor and manage viscoelastic changes during cure and the CSS300 suite for legacy control. Software tools are available to simulate and evaluate new processing methods. The mission of the company is to enable the use of processing science in the production of composite structures.

**T37** **Bryte Technologies Inc.** **150**  
**18410 Butterfield Blvd.**  
**Morgan Hill, CA 95037**  
**[www.brytetech.com](http://www.brytetech.com)**

Bryte Technologies is changing it's name to TenCate Advanced Composites; a worldwide supplier of thermosetting and thermoplastic advanced composite materials for aerospace and commercial markets. The company also provides armoring solutions based upon composite and composite/ceramic technology. A wide range of products are offered, including fabric and unidirectional tape prepregs, syntactic foams, film and paste adhesives, RTM and VARTM resin systems, and thermal management materials. The company also offers a complete line of anti-ballistic solutions useful in personal, vehicle and aircraft protection for military and civilian applications.

**Burnham Composites, Inc.** **107**  
**4203 W. Harry**  
**Wichita, KS 67209**  
**[www.BurnhamComposites.com](http://www.BurnhamComposites.com)**

Burnham Composites, Inc. is a composites supplier with capabilities including design and fabrication of high performance composite bond tools (Epoxy or Bismaleimide), prototype tooling, Fiber-Lok tooling reinforcement materials and eggcrate kits. Burnham also fabricates composite parts. We can support your tool string with Catia V5 design, 5-axis milling, autoclave curing, laser and Ultrasonic inspection capabilities. Current tooling programs include F-35 Joint Strike Fighter, Northrop Grumman's Global Hawk and J-UCAS, Boeing's B787 and J-UCAS, and Raytheon's Premier and Horizon Programs.

**Canyon Composites** **T18**  
**1548 N. Gemini Place**  
**Anaheim, CA 92801**

Canyon Composites is a leading supplier of complex aerospace structures. Our Anaheim, Calif. facilities have fabricated and assembled hardware on countless spacecraft using state-of-the-art materials, processes, and manufacturing. With strong heritage in the most challenging materials, processes, and manufacture. Canyon is the right company for your project.

**Carl Zeiss Microlmaging, Inc.** **154**  
**One Zeiss Drive**  
**Thornwood, NY 10594**  
**[www.zeiss.com/micro](http://www.zeiss.com/micro)**

Carl Zeiss offers a full line of upright, inverted, stereo and confocal microscopes, image analysis systems and digital cameras for all materials applications including research, metallurgy, surface topography, metrology, quality assurance, and failure analysis. Zeiss specializes in high-resolution digital imaging systems for demanding applications.



We make it visible.

**CCS Composites** **T 25**  
**3070 Bay Vista Court**  
**Benicia, CA 94510**  
**[www.ccscomposites.com](http://www.ccscomposites.com)**

CCS Composites provides compression molding expertise for custom and production molding of high performance carbon fiber and glass reinforced thermosets. We mold your ideas into reality.

# Exhibitor's Products and Services Listing

**CMC Interconnect Technologies**  
**7755 South Research Drive #115**  
**Tempe, AZ 85233**  
**[www.cmcinterconnect.com](http://www.cmcinterconnect.com)**

CMC Interconnect Technologies is a technology services business focused on electronic interconnect and advanced materials. The unique business model combines technical consulting, materials characterization, failure analysis and technical market studies. Personnel include PhD level engineers with industry experience and expertise in advanced materials. Clients include semiconductor manufacturers, advanced materials companies, package and substrate suppliers, and subcontract and EMS companies, from start-ups to Fortune 100 companies.

**Composites One**  
**723 W. Algonquin Road**  
**Arlington Heights, IL 60005**  
**[www.compositesone.com](http://www.compositesone.com)**

Today's emerging markets are opening the door to new opportunities for composite manufacturers. Composites One can offer you the products and services needed to take advantage of these new opportunities. We're the one place for all your composite needs for markets such as wind energy, ballistics, closed mold, infrastructure, aerospace, and cured-in-place-pipe.

**CRDF**  
**1530 Wilson Blvd., 3<sup>rd</sup> Floor**  
**Arlington, VA 22209**  
**[www.crdf.org](http://www.crdf.org)**

CRDF supports research projects that offer scientists and engineers alternatives to emigration and strengthen the S & T infrastructure of their home countries. CRDF facilitates economic development; promotes research opportunities; and helps move promising projects quickly to commercialization. CRDF offers a unique set of financial and project management services to support other organization collaborative scientific research, educational or charitable activities.

**Cytec Engineered Materials**  
**1085 E. Technology Circle**  
**Tempe, AZ 85284**  
**[www.cytecengineeredmaterials.com](http://www.cytecengineeredmaterials.com)**

Cytec Engineered Materials is a global industry leader that manufactures high-performance composites and adhesives, and PAN and pitch-based carbon fibers. The extensive product line includes toughend resin infusion systems, ablatives, carbon-carbon materials for high-temperature applications, silicone-based sealants and specialty thermoplastic materials. The strong technical team provides manufacturing, design and applications expertise.

**DeComp Composites**  
**Rural Route 4, Box 4460**  
**Cleveland, OK 74020**  
**[www.decomp.com](http://www.decomp.com)**

De-Comp Composites, Inc. is a rapidly growing distributor of all types of composite manufacturing support materials. We handle products from several major manufacturers, these products include but are not limited to vacuum bag films; release films, liquids, and fabrics; adhesive and sealant tapes; autoclave valves and hoses; castable urethane elastomer; tooling resins, and tool support structures. Our complete product line is quite extensive and covers nearly all aspects of composite structure and tooling manufacturing.

**T15** **DIAB Inc.** **104**  
**315 Seahawk Drive**  
**DeSoto, TX 75115**  
**[www.diabgroup.com](http://www.diabgroup.com)**

DIAB is the world leader in structural core materials and sandwich composite technology; DIAB supplies materials and solutions that make products light, strong, and competitive. DIAB's advanced polymer foam Divinycell, end-grain ProBalsa, core bedding adhesive, and panels are designed for demanding applications and provide design freedom, optimized weight, superior strength, excellent fatigue life, stiffness, and toughness. DIAB also provides advanced testing, design, and engineering services.

**T23** **Diamond Fiber Composites, Inc.** **T14**  
**5746 Este Avenue**  
**Cincinnati, OH 45232**  
**[www.diamondfiber.com](http://www.diamondfiber.com)**

Diamond Fiber Composites, Inc. is a domestic producer of metal plated carbon fibers. Standard products include Ni, Cu, and Cu/Ni plating on PAN based carbon fibers. Typical applications for these metal plated carbon fiber include: EMI and RFI Shielding, and Lightning Strike Protection.

**140** **DYNAMOLD, Inc.** **T11**  
**2905 Shamrock Avenue**  
**Fort Worth, TX 76107**  
**[www.dynamold.com](http://www.dynamold.com)**

Dynamold, Inc. manufactures and distributes moldable epoxy shim materials, both in two-part systems and frozen pre-catalyzed sheets or strips for aircraft construction and shipbuilding chocks; rheology grade dimensional and surface measuring materials and magnetic rubber inspection material for non destruct inspection.

**155** **Eeonyx Corporation** **T6**  
**750 Belmont Way**  
**Pinole, CA 94564**  
**[www.eeonyx.com](http://www.eeonyx.com)**

Eeonyx produces electrically conductive materials - Eeonomer® powders and EeonTex™ textiles. EeonTex™ textiles represent fabrics that are coated with a thin, uniform layer of permanently conductive polymer. There are numerous applications of EeonTex™ fabrics in pressure and radiation sensors, ground penetrating radars, artificial horizon, low RCS antenna systems, resistive heaters and static control.

**108** **EDO Corporation** **130**  
**New York, NY**  
**[www.edocorp.com](http://www.edocorp.com)**

EDO provides a full design, analysis, prototyping, and production fabrication of advanced composite structural systems. EDO products include primary aerospace structures, missile fuselages, holding tanks, pressure vessels, & launch tubes. Composite capabilities include braiding, filament winding, hand layup pre-preg, resin transfer molding (RTM), vacuum assisted RTM (VaRTM).





# Exhibitor's Products and Services Listing

**Entec Composite Machines**  
2975 A. 300 W  
Salt Lake City, UT 84115  
[www.entec.com](http://www.entec.com)

**E.T. Horn Company**  
16141 Heron Avenue  
La Mirada, CA 90638  
[www.ethorn.com](http://www.ethorn.com)

The E.T. Horn Company, a leading supplier of technology to composite manufacturers is now representing basalt fiber reinforcements from Kamenny & Vek. Additionally we are showcasing other new product developments including toughened epoxies from Dow; 3M's high strength Glass Bubbles; PU systems from Bayer and introducing Nano Resins from Hanse-Chemie.

**Euro-Composites, Corp.**  
13213 Airpark Drive  
Elkwood, VA 22718  
[www.euro-composites.com](http://www.euro-composites.com)

Euro-Composites Corporation is a leading global manufacturer of lightweight products for aerospace, transportation, marine and industrial applications. Products utilize the extraordinary strength to weight ratio of Nomex, Kevlar and aluminum honeycomb core. Capabilities include core manufacture, sandwich panel production, thermal forming, splicing, bonding and 5 axis CNC machining.

**Fatigue Technology Inc.**  
401 Andover Park East  
Seattle, WA 98188-7605  
[www.fatiguetech.com](http://www.fatiguetech.com)

Fatigue Technology Inc. (FTI) pioneered cold expansion technology over 35 years ago and has advanced this science to develop innovative solutions for bushing installations, fastener applications and aerospace fitting and hardware installations. FTI products can improve aircraft structural durability and reduce manufacturing and maintenance flow-time and costs.

**Flow International**  
23500 64<sup>th</sup> Avenue South  
Kent, WA 98032  
[www.flowcorp.com](http://www.flowcorp.com)

Flow International Corporation is the aerospace industry's leading supplier of waterjet technology. Flow waterjets are used to manufacture everything from turbine blades to entire fuselages. Our systems have been involved in every major aerospace program since the early 1980's. See how we can help make your program take off.

**Formglas, Inc.**  
2 Champagne Drive  
Toronto, ON M3J 2C5, Canada  
[www.formglas.com/pattern](http://www.formglas.com/pattern)

Formglas fabricates tooling for composites. Formglas specializes in large, high precision tooling requirements. We can offer you a great price, high quality and value.

We understand tight delivery schedules and will work with you to help keep your project on track.

Please call for more information or visit our web site for info regarding (ISO) 9001:2000 registration and our (5) Axis CNC Machining & CatiaV5 tool design Services.

**T21 General Magnaplate** **143**  
1331 U.S. Route 1  
Linden, NJ 07036  
[www.magnaplate.com](http://www.magnaplate.com)

**T35 General Plastics Mfg. Co.** **138**  
4910 Burlington Way  
Tacoma, WA 98409  
[www.generalplastics.com](http://www.generalplastics.com)

Manufacturer of LAST-A-FOAM® rigid and flexible high-density polyurethane foam products for applications in aircraft/aerospace, industrial processing, marine FRP laminates, building construction, nuclear material shipping, composite tooling, models and prototypes, and thermal insulation. We are specialists in fulfilling high-performance requirements with innovative cellular-solid products. Stop by to see our economical FR-4500 series anti-static tooling boards, and wide variety of urethane-foam core materials. Also, investigate our new \*FR-10700 High Temperature Tooling Board\* for 300+ degree service.

**Graco Supply Company** **T47**  
1001 Miller Avenue  
Ft Worth, TX 76105  
[www.gracosupply.com](http://www.gracosupply.com)

Graco Supply Company is a stocking distributor serving primarily the aerospace industry in North America. We represent the premier manufacturers of composite materials and time/temperature sensitive adhesives, sealants and coatings including Airtech, Henkel Aerospace, Huntsman, ANAC, 3M Aerospace. Our value added approach includes technical service, repacking/resizing and customized supply chain solutions. We are headquartered in Ft Worth and have another warehouse in Wichita, KS.

**Green Sales Guy - GSG, Inc.** **T20**  
8443 Strato Drive  
Sandy, UT 84093  
[www.theGREENsalesguy.com](http://www.theGREENsalesguy.com)

GSG is a manufacturer's representative company with over 19 years selling experience in composites, specializing in sales and support of filament winding machines and other composite process equipment. GSG represents the following companies: Bolenz & Schaefer (BSD), Brenner International, Eastman Machine Company, Lynco Grinding, Material S.A, MJC Engineering/Technology, Rocky Mountain Composites.

**Heatcon Composite Systems** **T22**  
600 Andover Park East  
Seattle, WA 98188  
[www.heatcon.com](http://www.heatcon.com)

HEATCON® Composite Systems is the world leading manufacturer and supplier of aerospace composite repair training, equipment, accessories, and materials. We supply heat blankets, composite repair equipment, and materials, in large and small quantities for immediate delivery. Stop by Booth 330 and find out why the HEATCON® catalog belongs on your desk.

# Exhibitor's Products and Services Listing

**Henkel Corporation - Aerospace**  
**2850 Willow Pass Road, P.O. Box 312**  
**Bay Point, CA 94565**  
**[www.aerospace.henkel.com](http://www.aerospace.henkel.com)**

The aerospace group of Henkel provides structural adhesives and metal surfacing treatments for composite and aerospace industries. Key brands include Hysol® structural adhesives and Turco® metal surface treatments. Complementary products include Frekote® mold releases and Alodine® conversion coatings. Please see our website at [www.aerospace.henkel.com](http://www.aerospace.henkel.com) for literature, technical papers and data sheets.

**Helicomb International**  
**1402 S. 69<sup>th</sup> East Avenue**  
**Tulsa, OK 74112**  
**[www.helicomb.com](http://www.helicomb.com)**

Helicomb International is a manufacturer of composite & metal bonded assemblies to the aerospace industry Helicomb International Inc. has a Boeing Silver Supplier Performance rating with 99.7% quality and 100% on time delivery. Our core competencies include fabrication and assembly of composite bonded structures, metal bonded structures, and metal processing for aluminum, stainless steel, and titanium. Helicomb is 3<sup>rd</sup> party certified by DNV to AS9100:2001 Section 1, ISO 9001:2000. We hold special process certifications for Boeing, Northrop Grumman and Lockheed Martin and for Digital Product Definition (DPD) and Model Based Definition (MBD).

**High-Performance Composites**  
**4891 Independence Street, #270**  
**Wheat Ridge, CO 80033**  
**[www.compositesworld.com](http://www.compositesworld.com)**

Description: High-Performance Composites magazine provides hands-on technical information about the design, manufacture and performance of products and parts made from advanced polymer-matrix composites, primarily those employing continuous carbon fiber, aramid or S-glass reinforcements. Composites Technology provides practical, application-oriented information about the design, manufacture and performance of products made with fiberglass-reinforced composites as well as components utilizing chopped fiber materials and hybrids.

**HITCO Carbon Composites, Inc.**  
**1600 W. 135<sup>th</sup> Street**  
**Gardena, CA 90249-2506**  
**[www.hitco.com](http://www.hitco.com)**

Hitco Carbon Composites, Inc. manufactures advanced composite materials for aerospace and industrial applications. Its products range from solid rocket motor nozzle assemblies, aircraft assemblies, naval composite structures, wet & dry friction applications such as aircraft and automotive torque control assemblies and transmissions, & materials for industrial insulation for the aluminum & steel industries, among others. Hitco also manufactures & markets REFRASIL™ silica materials for thermal protection. Founded in 1922, HITCO continues to be an innovative leader in the advancement of carbon composite technologies.

**135 Huntsman Advanced Materials**  
**10003 Woodloch Forest Drive**  
**The Woodlands, TX 77381**  
**[www.huntsman.com](http://www.huntsman.com)**

Huntsman Advanced Materials will highlight its full range of high-performance systems for aero-space, transportation and other advanced



composites applications at booth #132. Among featured product lines are: stereolithography photopolymers; high-value thermoset systems for fiber-reinforcement technologies; epoxy adhesives and syntactics; seamless epoxy modeling pastes: infusion materials and CNC-machinable tooling boards.

**Inspec Foams, Inc. - ROHACELL®**  
**(Formerly - Rohm America, ROHACELL®)**  
**1560 Hwy 371 South**  
**Magnolia, AR 71753**  
**[www.rohacell.com](http://www.rohacell.com)**

Degussa AG, Röhm GmbH, Inspec Foams, Inc. maintains the world leadership position as manufacturer/seller of the widest range of structural sandwich panel foam core, marketed under the trade name ROHACELL®. Ten different Grades in various densities are available to suit commonly used composite manufacturing processes, i.e. VARTM, VARI, SLI, RFI, RTM and hand lay-up/autoclaving. Our ROHACELL® foam cores meet the demanding sandwich structural requirements in markets such as: aerospace, medical, automotive, wind energy, mass transportation, marine and others. Applications range from wind turbine blades to large satellite launch vehicle fairing/components.

**Integran Technologies Inc.**  
**1 Meridian Rd., Toronto, Ontario, M9W 4Z6**  
**[www.integran.com](http://www.integran.com)**

Integran Technologies Inc. is the world's premiere supplier of nanostructured materials. Integran's most popular products are high strength, wear resistant metallic coatings. Applications include coatings for increased durability composite aerospace molds, increased wear resistant composite aerospace parts, functional strength plastic parts, and high strength metal foils.

**JPS Composite Materials**  
**101 Slater Road**  
**Slater, SC 29683**  
**[www.jpocompositematerials.com](http://www.jpocompositematerials.com)**

Manufacturer of fiberglass, S-2 glass and Astroquartz® fabric composite reinforcement for commercial and military applications (i.e. printed circuit boards, laminate panels, radome antennas). Primary markets include electronics, aerospace, filtration, insulation, anti-ballistic protection, and construction.

# Exhibitor's Products and Services Listing

**KRAYDEN Inc.**  
**491 E. 124<sup>th</sup> Avenue**  
**Denver, CO 80241**  
**[www.krayden.com](http://www.krayden.com)**

Krayden, Inc stocks and distributes adhesives, sealants, encapsulants, coatings, solder, solder chemicals, release agents, dispensing equipment and supplies. We serve you more efficiently by adding technical service.

**LAP Laser**  
**7669 Wooster Pike**  
**Cincinnati, OH 45227**  
**[www.lap-laser.com](http://www.lap-laser.com)**

The CAD-Pro 3D provides immediate projection of composite ply outlines and/or parts positioning from any CAD drawing. Our new UF controller provides the highest projection speed and accuracy available. The CAD-Pro can be used to structure workflow with our simple, easy-to-use Pro-Soft 3D software. Get the highest performance in the smallest package!

**Lucas Industries**  
**201 Clinton Street**  
**Springfield, VT 05156**  
**[www.lucasindustries.com](http://www.lucasindustries.com)**

For over 30 years, Lucas Industries has specialized in both designing and fabricating intricate tools, parts, models, molds and patterns. We use virtually every metallic/nonmetallic material available, including wood, epoxy, urethanes, foams, and rubbers. Lucas also provides aluminum and/or steel cast molds to afford our customers substantial savings. Our engineers have unsurpassed expertise in the most advanced level of CATIA and Pro Engineer - the very nucleus of our CAD/CAM manufacturing language.

**Matec Instrument Companies, Inc.**  
**56 Hudson Street**  
**Northborough, MA 01532**  
**[www.matec.com](http://www.matec.com)**

Matec Instrument Companies, Inc. is a leading ultrasonic systems integrator and instrument supplier of quality control inspection and production test equipment. Matec has been providing ultrasonic instrumentation to research and industrial users since 1968. Products offered by Matec include composite scanning and measurement systems, stand-alone and PC-based ultrasonic plug-in cards, portable ultrasonic workstations, and Windows<sup>®</sup>-based control and data acquisition software.

**Maverick Corporation**  
**11379 Grooms Road**  
**Blue Ash, OH 45242**  
**[www.maverickCorp.com](http://www.maverickCorp.com)**

Maverick Corporation is a leader in research, development and production of advanced polymer materials for the aerospace, medical, industrial and related industries. Maverick's product portfolio includes aerospace-qualified polyimide resins (liquid and powder) capable of withstanding environments over 700°F and a family of affordable, non-toxic resins for RTM, autoclave and compression molding applications from 400°F to greater than 600°F. Maverick is also an aerospace-qualified source for compression molded composite parts.

**T16 Myers Engineering, Inc.**  
**8376 Salt Lake Avenue**  
**Bell, CA 90201**  
**[www.myersmixer.com](http://www.myersmixer.com)**

Myers Engineering has been supplying complex mixers and basket mill systems for over sixty years. Recently, a quad shaft mixer was added to the arsenal of designs that have been engineered and manufactured by the company. Customers rely on Myers to supply high quality, long lasting equipment that solve problems, increase production capacity and add to product profitability. Delivering those expectations is why customers keep coming back again and again.

**T34**

**National Refrigeration Company/  
Kelvinator Scientific**  
**563 Corbin Road**  
**Honea Path, SC 29654**  
**[www.kelvinatorcommercial.com](http://www.kelvinatorcommercial.com)**

National Refrigeration is a domestic manufacturer of Kelvinator Scientific brand freezers, for use in storage of premixed and frozen adhesives, at -40°C. and colder. Visit our booth to be introduced to our line of chest and upright models, ranging in capacity from 4.6 cu.ft. to 49.1 cu.ft.

**T36**

**Noran Engineering**  
**5555 Garden Grove**  
**Westminister, CA 92683**  
**[www.NENastran.com/composite](http://www.NENastran.com/composite)**

NEiNastran FEA software offers a suite of specialized capabilities dedicated to advanced composite analysis and manufacture. Perform structural, thermal, and vibration simulation; use laminate material definition tools; Application Programming Interface (API) enables powerful customization; failure criteria using Tsai-Wu, LaRC02, Puck, Hill, others; comprehensive file sharing and import; exceptional technical support and training classes. Customers include America's Cup yacht contenders, Formula One race cars, Tour de France bikes, Space Ship One, and many more leading composites product manufacturers.

**T36**

**Physical Acoustic Corporation**  
**195 Clarksville Road**  
**Princeton Junction, NJ 08550**  
**[www.pacndt.com](http://www.pacndt.com)**

Physical Acoustics Corporation (PAC) Group develops, manufactures and employs leading-edge nondestructive testing technologies, such as advanced acoustic emission sensors and systems, high-end ultrasonic inspection systems (including: automated Ultrasonic, C-Scan Ultrasonic Imaging and leak detection systems), and vibration monitoring equipment that provide on-line asset integrity management for Internet/intranet based predictive maintenance. The company also offers contract research, feasibility studies, engineering services as well as certification and training courses related to nondestructive evaluation/testing.

**T31**

**Plasma Technology Systems**  
**276 Harbor Blvd.**  
**Belmont, CA 94002**  
**[www.PlasmaTechSystems.com](http://www.PlasmaTechSystems.com)**

Plasma Technology Systems offer plasma gas vacuum equipment for molecular re-engineering of surfaces. Services include process development, contract services, equipment rentals and sales, equipment design, consulting and training. The product line includes systems for batch processing with chambers up to 125 cubic feet, continuous profile treatment, and web, film and membrane handling systems up to 60 inches. Services are supported by a team of engineers with over 25 years in the industry.

**T27**

# Exhibitor's Products and Services Listing

**Quartus Engineering, Inc.**  
**10251 Vista Sorrento Pkwy #250**  
**San Diego, CA 92121**  
**[www.quartus.com](http://www.quartus.com)**

Quartus Engineering provides mechanical engineering design, analysis, testing, and prototyping services to the aerospace, defense, electronics, consumer products, and entertainment industries in the US and Canada. Our staff of 55 mechanical and aerospace engineers are located in San Diego and Los Angeles.

**Quickstep Technologies**  
**136 Cockburn Road**  
**North Coogee, Western Australia 6166**  
**Australia**  
**[www.quickstep.com.au](http://www.quickstep.com.au)**

Inventor of the patented Quickstep process, an out-of-autoclave method for fabricating advanced composites using prepregs, VARTM and other inputs. The company licenses the technology, supplies manufacturing equipment and undertakes contract prototype development and short-run production.

**Reinhold Industries, Inc.**  
**12827 East Imperial Highway**  
**Santa Fe Springs, CA 90670**  
**[www.reinhold-ind.com](http://www.reinhold-ind.com)**

Reinhold Industries has been a market leader in the fabrication of advanced composites hardware for over 70 years. Reinhold is an ISO9001:2000 registered full-service manufacturing leader in ablative rocket nozzles and composite aircraft seat backs. With over 145,000 square feet and 130 plus employee base, Reinhold is poised to help you manufacture your designs into production assemblies and components.

**Reno Machine Company Inc.**  
**170 Pane Road**  
**Newington, CT 06111**  
**[www.reno-machine.com](http://www.reno-machine.com)**

Reno Machine will be presenting their design and manufacturing process of precision metallic molds used in the molding of complex composite parts. This cost effective process begins with the utilization of the parts solid model that in turn drives five axis CNC gantry mills. Costly man hours associated with hand polishing is minimized, producing net configuration parts.

**Richmond Aircraft Products**  
**13503 Pumice Court**  
**Norwalk, CA 90650**  
**[www.richmondaircraft.com](http://www.richmondaircraft.com)**

Multi-layered Vac-Pak bagging films, release films, peel plies, release fabrics, breathers, bleeders, sealant tapes, pressure sensitive tapes, vacuum valves & hoses for all temperatures & resin systems. Custom shaped heat-sealed vacuum bags for any size application. Low cost materials for use in wind energy, marine & resin infusion industries.

**T7 SAMPE**  
**1161 Park View Drive, Suite 200**  
**Covina, CA 91724-3751**  
**626-331-0616**  
**[www.sampe.org](http://www.sampe.org)**

An international professional member-owned society provides information via technical forums, journals and conferences. As the only technical society encompassing all fields in materials and processes...SAMPE provides a unique and valuable forum for scientists, engineers and academicians.



**102 Taricco™ Corporation**  
**1500 W. 16<sup>th</sup> Street**  
**Long Beach, CA 90813**  
**[www.taricco.com](http://www.taricco.com)**

The leading autoclave manufacturer for the Boeing 787 program, Taricco™ Corporation can meet all your thermal process equipment requirements. From the largest autoclave to the smallest oven, no project is too small or too large.

Since 1957, the Taricco family has been a pioneer and manufacturer of thermal process equipment. Taricco™ Corporation engineers and fabricates large scale A.S.M.E. Div I & Div II, Section VIII accredited, National Board registered autoclave systems, ovens, and presses.

**145 Technical Fibre Products, Inc.**  
**250 Route 17K**  
**Newburgh, NY 12550**  
**[www.techfibres.com](http://www.techfibres.com)**

TFP provides surfacing, fire protection & physical property modification solutions to the aerospace, automotive, construction, transportation, medical device & recreation/consumer product markets. Products include nonwoven mats & veils made from aramids, carbon (pan, pitch, and nickel coated), intumescent, polyester, glass, ceramic and quartz. Solutions can be custom tailored to specific requirements such as conductivity/resistivity, EMI/RFI shielding, passive fire protection, corrosion protection, friction & surfacing/adhesive systems.

**126 Reno Machine Company Inc.**  
**170 Pane Road**  
**Newington, CT 06111**  
**[www.reno-machine.com](http://www.reno-machine.com)**

**T8 Textile Products Inc.**  
**2516 W. Woodland Drive**  
**Anaheim, CA 92801**  
**[www.textileproducts.com](http://www.textileproducts.com)**

Engineered woven fabrics for aerospace, commercial, recreational and industrial applications. Bidirectional, unidirectional and multilayer fabrics, woven from carbon, glass, aramid and ceramic fibers.

**115 Tinius Olsen**  
**1065 Easton Road**  
**Horsham, PA 19044**  
**[www.TiniusOlsen.com](http://www.TiniusOlsen.com)**

Tinius Olsen is one of the world's foremost specialist manufacturers and supplier of testing machines for use in Research and Quality Control departments to measure the strength and performance of materials, be they metals, composites, polymers, rubbers, adhesives, etc., and finished components. Tests include tension, shear, compression, flexure, puncture, tear, peel, melt flow, impact, friction, stiffness, heat distortion, and torsion tests and are designed by Tinius Olsen in accordance with key international testing standards.

**113**

**T2**

**T8**

**T48**

**T1**



# Exhibitor's Products and Services Listing

**Toho Tenax America, Inc.**  
**121 Cardiff Valley Road**  
**Rockwood, TN, 37854-4134**  
**[www.tohotenaxamerica.com](http://www.tohotenaxamerica.com)**

PAN based Carbon Fibers from 1K – 24K, for Aerospace, Industrial and Recreational end-uses. Chopped strand and milled fibers, palletized chopped and milled, Nickel coated carbon fiber, "Pyromex®" OPF Oxidized PAN Fiber.

**Trelleborg Emerson & Cuming**  
**59 Walpole Street**  
**Canton, MA 02021**  
**[www.trelleborg.com](http://www.trelleborg.com)**

Trelleborg Emerson & Cuming manufactures specialized products for the aerospace & defense industry. Beginning with the worlds leading specialized Microballoons facility, products are developed for, reduce weight, insulation, conductivity, opacity, and high strength capabilities. Microballoons are of glass, carbon, phenolic, plastic and other materials.

**Triumph Fabrications - Fort Worth, Inc.**  
**7445 East Lancaster**  
**Fort Worth, TX 76112**  
**[www.triumphgroup.com](http://www.triumphgroup.com)**

Triumph Fabrications - Fort Worth, Inc. is a world leader in metal and composite bonding of both structural and non-structural components for the aerospace industry. With

extensive machining and sheet metal capability, Triumph

Fabrications - Fort Worth, Inc. can provide a wide range of services including, sub-assembly processing and system/component integration.



**Utility Composites Intl LTD**  
**2704A Meister Place**  
**Round Rock, TX 78664**  
**[www.raptornails.com](http://www.raptornails.com)**

In addition to RAPTOR composite nails and staples, used widely in composites manufacturing, UCI introduces a new product at this show. RAPTOR foam joining nails have two opposing points that are pushed into the interface of the foam joint to hold it together. They are repositionable and leave no exposed fasteners.

**Ultracor Inc.**  
**136 Wright Brothers Avenue**  
**Livermore, CA 94551**  
**[www.ultracorinc.com](http://www.ultracorinc.com)**

Manufacturer of specialty non-metallic honeycombs and corrugations. Including: Carbon, kevlar, quartz and carbon-carbon.

**V2 Composites**  
**770 Lee Road 191**  
**Auburn, AL 36830**  
**[www.v2composites.com](http://www.v2composites.com)**

V2 produces knitted fabrics and uni-directionals made from carbon, aramid, S glass, fiberglass and hybrids. Available in + -45/0/90 (biax/triax/quad). We also produce a 7 osy (250 gsm) and a 9 osy (320 gsm) carbon uni. The fibers are held in place by a very open, light scrim.

**T27 Virtek Vision International**  
**785 Bridge Street**  
**Waterloo, Ontario, N2V 2K1, Canada**  
**[www.virtek.ca](http://www.virtek.ca)**

VIRTEK is a leading provider of precision laser-based temp-lating, inspection, laser marking and engraving products & systems integration



solutions that enable customers to produce their products faster, better & at a lower cost. More aerospace manufacturers world-wide rely on Virtek laser template solutions than any other, including: Virtek LaserEdge® systems with true multitasking capability; Virtek LaserEdge® Planner process planning & productivity software tool; Virtek LPS7 laser projectors, now lighter, faster & cooler running.

**Vistagy**  
**200 Fifth Avenue, 5th Floor**  
**Waltham, MA 02451**  
**[www.vistagy.com](http://www.vistagy.com)**

FiberSIM® is a suite of software products, powered by VISTAGY's unique EnCapta® technology, that turns commercial CAD systems into tools specialized for designing and manufacturing composite parts. The software enables engineers to create a complete digital product definition of a composite part within their 3D modeling environment. FiberSIM supports the entire product development process as well as flexible design methodologies for a wide variety of materials and manufacturing methods. The software simulates how composite material deforms over complex curvature and generates manufacturing information including documentation, flat patterns, and data to drive downstream manufacturing equipment. FiberSIM also uses XML technology to share composites data with people and applications throughout the enterprise.

**Webcore Technologies**  
**8821 Washington Church Road**  
**Dayton, OH 45342**  
**[www.webcoreonline.com](http://www.webcoreonline.com)**

WebCore is a designer and manufacturer of TYCOR - a family of composite sandwich core products designed for use in vacuum infusion processes, RTM lite, closed molding and other resin transfer systems. TYCOR cores provides superior strength and stiffness, impact resistance, and durability, while affording weight and cost savings, for structural applications in transportation, wind energy, marine, industrial, and infrastructure markets. Excellent technical product and process support available.

**YLA, Inc.**  
**2970 Bay Vista Court**  
**Benicia, CA 94510**  
**[www.YLAINC.com](http://www.YLAINC.com)**

YLA, Inc. is a recognized leader in development and manufacture of innovative, high performance composite materials for extreme temperature and environmental exposure. The world's largest manufacturers of aerospace, satellite, aircraft, naval/marine structures and other major industries rely on YLA to develop their precise advanced composite formulations. YLA's high-capacity production resources can meet the ramp-up needs of the most demanding applications and schedules. Total customer satisfaction is our top priority and is achieved through rapid response, rapid product development and rapid delivery.

## Save the Date

April 2-4, 2007	SAMPE Europe Technical Conference, 28 <sup>th</sup> International Conference and Forum Hotel Mercure, Paris, France
June 3-7, 2007	SAMPE '07, Baltimore Convention Center, Baltimore, MD
September 6-7, 2007	SAMPE Europe Technical Conference-02 (SETEC 02/-07) Universitat Politecnica de Madrid, Madrid, Spain
October 29-November 1, 2007	SAMPE Fall Technical Conference, Hilton Cincinnati Netherland Plaza, Cincinnati, OH
November TBD 2007	10 <sup>th</sup> Japan International SAMPE Symposium & Exhibition (JISSE-10) Big Sight Convention Center, Tokyo, Japan
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Japan Conferences:	Dr. Asami Nakai, Secretariat of JISSE-9 Division of Advanced Fibro Science, Graduate School Kyoto Institute of Technology, Matsugasaki, Sakyo-ku, Kyoto 606-8585, Japan Tel: +81-75-724-7844 • Fax: +81-75-724-7800 • E-Mail: jisse-8@ipc.kit.ac.jp www.gisolab.t.u-tokyo.ac.jp/jisse9/index.html



## Save The Date Oct 23rd - Nov 10th, 2006

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