



**SOCIETY FOR THE ADVANCEMENT  
OF MATERIAL AND PROCESS  
ENGINEERING  
NEW JERSEY CHAPTER**

**OCTOBER NEWSLETTER & MONTHLY NOTICE**

**OCTOBER 1, 2009 (1<sup>ST</sup> THURSDAY)**

**DEVELOPMENT AND TESTING OF PRESTRESSED CARBON FIBER  
COMPOSITE OVERWRAPPED GUN TUBES**

**A.G. LITTLEFIELD  
US Army RDECOM-ARDEC  
Benét Laboratories  
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[andrew.littlefield@us.army.mil](mailto:andrew.littlefield@us.army.mil)**

**MEETING DETAILS**

Place: Bridgewater Manor, Bridgewater, NJ; (908) 658-3000  
Time: 5:30 Cocktails (Cash Bar); 6:15 Dinner; 8:30 Adjourn  
Cost: \$10.00 Advanced Registration; \$15.00 at Door; Students - Free

**This meeting is open to all SAMPE members, spouses, guests, and other interested parties**

Reservations please contact John Osterndorf at 973-248-5885 or by email at [sampejohn@yahoo.com](mailto:sampejohn@yahoo.com)  
by noon the Wednesday before the meeting.

**Directions to Bridgewater Manor:** From I-287 north, take exit 22A (206 south). Go thru two lights, Bridgewater Manor is on right. From I-287 south, take exit 22. Make right at end of ramp. Make next left, a jughandle to cross 202/206 to go south on 202/206. Go thru three lights, Bridgewater Manor is on the right.

**SAMPE BEST CHAPTER AWARD WINNER**

**1990, 1991, 1992, 1993, 1995, 1996, 1997, 1998, 1999, 2000, 2001**

**SAMPE CHAPTER SERVICE EXCELLENCE AWARD WINNER**

**2002, 2003, 2004, 2005, 2006 (award suspended after 2006)**



**NEW JERSEY CHAPTER SAMPE  
OCTOBER NEWSLETTER  
Page 2**

**2009 – 2010 MEETING SCHEDULE**

September 10, 2009 – NDE of Multilayered Composites, Nicholas Gianaris, General Dynamics Land Systems, Sterling Heights, MI	March 4, 2010 – TBD
October 1, 2009 – Development and Testing of Prestressed Carbon Fiber Composite Overwrapped Gun Tubes, A. G. Littlefield, Benet Laboratories, Watervliet, NY	April 1, 2010 – TBD
October 19 – 22, 2009 41 <sup>st</sup> International SAMPE Technical Conference, Wichita, KS, Sponsored by the New Jersey and Wichita Chapters	May 6, 2010 – TBD
November 5, 2009 – Extrusion of Recycled Plastics for Railroad Ties and Bridge Beams, Tom Nosker- research Professor – Rutgers University - Tentative	May 17 – 20, 2010 – 54 <sup>th</sup> International SAMPE Symposium & Exhibition, Washington State Convention Center, Seattle, WA Sponsored by Seattle Chapter
December 3, 2009 – UV Curing of Polymers, Jim Wittig- President- ACTEGA Radcure, Inc. - Tentative	June 3, 2010 – TBD
February 4, 2010 – High Performance Thermoplastics, Larry Stanislaw- Sales manager- Westlake Plastics	July 8, 2010 – 27 <sup>th</sup> Annual NJ SAMPE Golf Tournament, Picatinny Arsenal, NJ

**Notes ....** The NJ Chapter sponsors a student chapter at Drexel University in Philadelphia.

**SEPTEMBER MEETING**

At the September meeting, Mr. Nicholas Gianaris gave an excellent presentation entitled NDE of Multilayered Composites. The New Jersey Chapter wishes to thank Mr. Gianaris for the excellent presentation.

**UPCOMING EVENTS**

2009 International SAMPE Technical Conference,  
Wichita, KS, October 19 – 22, 2009

**“GLOBAL MATERIAL TECHNOLOGY SOARING TO NEW HORIZONS”**

The New Jersey and Wichita Chapters are co-sponsoring the 2009 ISTC.

2010 SAMPE International Symposium and Exhibition, Washington  
State Convention Center, May 17 – 20, 2010, Seattle, WA.

The Seattle SAMPE Chapter is sponsoring the 2010 ISS&E.



**NEW JERSEY CHAPTER SAMPE  
OCTOBER NEWSLETTER  
Page 3**

**DEVELOPMENT AND TESTING OF  
PRESTRESSED CARBON FIBER COMPOSITE  
OVERWRAPPED GUN TUBES**

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**ABSTRACT:**

Advanced composite materials are needed for lightweight large caliber weapons systems. The use of a thermoplastic resin, with fibre placement under tension has overcome the traditional problems of the coefficient of thermal expansion mismatch between the substrate and the jacket, and the lack of favourable prestress in the jacket. Three 120mm gun tubes were designed, built and tested using this process. This presentation will discuss the findings of this study.

**BIOGRAPHY:**

Dr. Andrew Littlefield holds a Ph.D. in Mechanical Engineering from Rensselaer Polytechnic Institute. Prior to joining Benét in 2000, Dr. Littlefield worked for the Air Force Research Lab on applying composites to spacecraft structures on programs such as an isogrid satellite body, low cost composite space boom, and a composite satellite antennae mast. Dr. Littlefield is the lead composite engineer at Benét and has worked on composite gun tubes, electromagnetic railgun launchers, a composite gun tube support for FCS-MRAAS, composite gun shrouds, gun barrel vibration absorbers, and simulated proof testing of mortar baseplates. He has received the 2008 and 2004 Army Research & Development Achievement Awards, two Director's Awards from the Shock and Vibration Information Analysis Center (SAVIAC), a Benét Teamwork award in 2002, and a best paper award from the Society for the Advancement of Material and Process Engineering (SAMPE). He has been the lead author on journal papers, several conference papers, and technical reports. He currently has two patent applications pending. He is a member of ASME, SAMPE, Tau Beta Pi, and Pi Tau Sigma.



**NEW JERSEY CHAPTER SAMPE  
OCTOBER NEWSLETTER  
Page 4**

**41<sup>ST</sup> INTERNATIONAL SAMPE TECHNICAL CONFERENCE  
SAMPE 2009 – WICHITA**

The SAMPE Fall Technical Conference, scheduled for October 19 – 22, in Wichita, Kansas, that is being sponsored by the New Jersey and Wichita Chapters of SAMPE is moving along at a rapid pace. Here's an overview of where we are 2 months out.

Technical Program

We have about 47 sessions, some of which will drop out as we consolidate in the final program. Presently there are 179 papers under review (14 are ITAR restricted). We have done exceedingly well in converting abstracts into full papers. Because the conference locale is Wichita, the General Aviation capital of the world, we have purposely concentrated on A/A related sessions. The preliminary program was mailed out the week of July 27<sup>th</sup>.

Panels, Workshops and Invited Lectures

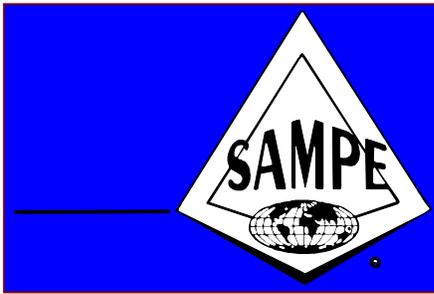
Panels have presentations without formal papers published. We have 6 confirmed panels – Benchmarking Composite Technology: Europe vs US, Energy Issues in Aviation, Commercializing Composites, Design/Analysis Tool Demonstration, Technologies to Assist Composite Manufacturing, and Damage Resistance of Sandwich Structures (joint with ASTM D30 committee). We also have an AFOSR sponsored workshop for Multiscale Modeling of PMC's. Finally, we have three invited lectures on Metal Composite Hybrids, The Role of Education in Composite Engineering and Acoustic Emission.

Keynote

John Pilla, Senior VP of Spirit Aerosystems and Persis Elwood, Director AFRL Manufacturing Division are our two confirmed Keynote speakers.

Tours

There will be two tours on Thursday afternoon, Spirit Aerosystems and NIAR (National Institute for Aviation Research) at Wichita State University



**NEW JERSEY CHAPTER SAMPE  
OCTOBER NEWSLETTER  
Page 5**

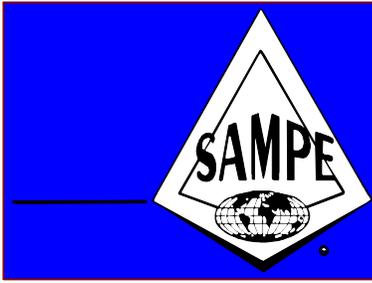
**INDUSTRY NEWS**

**Sensor Products, Madison, NJ**

*Sensor Products Inc.* presents Pressurex®, a thin Mylar-based sensor film that maps and measures the amount of interfacial stress exerted on honeycomb cores, composite lay-ups and bonded surfaces within composite structures. By using Pressurex® to see how surface stresses are distributed, an engineer can observe inconsistencies and misregistration in composite parts and thereby greatly reduce the yield defect rate. Other applications for Pressurex® include determination of press planarity in lamination processes, monitoring of vacuum bagging pressures, confirmation of pressure uniformity on wound filaments parts, and calibration of tools and equipment. Pressurex® is available in sheets or rolls. When placed between contacting or mating surfaces, the film instantaneously and permanently changes color. This color change is a direct result of the amount of pressure applied. Comparison of color variations to a color correlation chart (conceptually similar to interpreting Litmus paper) can help determine precise pressure magnitude. Pressurex® can detect pressures from 2 to 43,200 PSI (.14 to 3,037 kg/cm<sup>2</sup>). In the aerospace industry, Pressurex® has been used to determine the exact amount of pressure causing cracks in the inner spars of a helicopter's main rotor blade. A large sheet of Pressurex® was inserted into the bonding tool, bagged up, and pressurized in the autoclave. When the film was removed, the exact amount of pressure causing the crack was determined. To request a free sample of Pressurex®, email: [info@sensorprod.com](mailto:info@sensorprod.com).

**QUATRO COMPOSITES, ORANGE CITY, IOWA**

*Quatro Composites* is introducing their new fully stressed design optimization for composite structures; otherwise known as OptiPart™ composite optimization process. OptiParti™ is a proprietary system and process for developing an optimized and producible composite structure that utilizes finite element-based material and property-driven design tools to optimize structures based on load, space, mounting, operational, and manufacturing constraints. Using these tools, a design can be tailored to perform in specific load case or in service conditions while considering the manufacturing process and process constraints during the initial and preliminary design phases. Using Quatro's proprietary OptiPart™ design tools in conjunction with one of Quatro's proprietary out-of-autoclave processes, such as QPS3501, can provide a continuous carbon fiber structural solution that can reduce the weight of a similarly designed 7000 series aluminum part by as much as 50%. For more information, visit: [www.quatrocomposites.com](http://www.quatrocomposites.com).



## NEW JERSEY CHAPTER OCTOBER NEWSLETTER

Page 6

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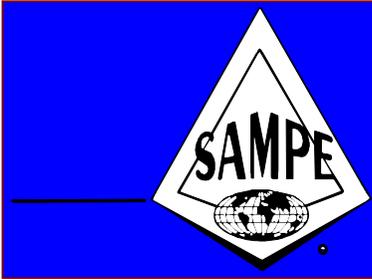
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**NEW JERSEY CHAPTER  
OCTOBER NEWSLETTER  
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Page 7**

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**OCTOBER NEWSLETTER  
CHAPTER SPONSORS  
Page 8**

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