

# CARBON FIBER 2009

Hilton San Diego Bayfront Hotel | San Diego, CA USA



**REGISTER TODAY!**

## Keynote Presentations:

*December 10th:*

*Will Composite Materials Be Attractive for the Next Generation Narrow-body Aircraft?*

Jens Hinrichsen, Dipl.-Ing, President  
Aerospace Advisory Group LLC

*December 11th:*

*Carbon Fiber Composites Research and Development at Automobili Lamborghini*

Maurizio Reggiani  
Vice-president of R&D and CTO,  
Automobili Lamborghini S.p.A.  
Sant'Agata Bolognese, Italy

Paolo Feraboli  
Professor and Director of the Automobili  
Lamborghini Composites Laboratory  
Department of Aeronautics & Astronautics,  
University of Washington  
Seattle, WA, USA

## Conference Co-Chairs:



Tom Lemire  
Western Regional Sales Manager  
Toho Tenax America, Inc.



Anthony (Tony) Roberts  
Principal  
AJR Consultant LLC

## Pre-Conference Seminars:

- *Carbon Fiber for Tomorrow – A Review of Current Technologies and the Path to Wide Spread Industrial Growth*  
*Presented by:* David Warren | Program Manager | ORNL  
(with others of ORNL)
- *The Global Outlook for Carbon Fiber Composites: Expansion as a Result of Efficiency and Productivity*  
*Presented by:* Tony Roberts | Principal | AJR Consultant LLC and  
Chris Red | Editor & VP Market Research | Composite Market Reports

Sponsored by:



In association with:

HIGH-PERFORMANCE  
**Composites**

**COMPOSITES**  
TECHNOLOGY

**"It was the best of times; it was the worst of times..."**

**Charles Dickens, A Tale of Two Cities**

Although quoted many times before, I find this portion of the opening line of this classic appropriate for the state of the carbon fiber market as we approach 2010. Those of us in the advanced composites business know the market will improve and the orders for aerospace and commercial aircraft such as the 787 and A350, although perhaps delayed, will sustain future growth of the market for carbon fiber. Planned capacity expansions by all the major suppliers—although postponed by some—and new suppliers, such as AKSA, will come online and secure supply for current aerospace and industrial applications. However, some potential new suppliers have had to put their entry plans on hold until better financing becomes available and the market improves.

Currently, there is an imbalance in the supply chain, with a surplus of fiber. Still, some of the wary industrial end users wonder if the current surplus is déjà vu all over again, and they will be relegated to allocation when production of the 787 and A350 reaches full speed.

It seemed clear at our *Carbon Fiber 2008* conference in Charleston that this market is being shaped by a number of forces besides aircraft, with industrial markets such as alternative energy applications, like wind and LNG, CNG and hydrogen storage tanks gaining ground. This diversity, unlike the market in the 1990s, was expected to ensure plenty of fiber demand for the next decade. But what about these industrial markets? What can high-volume production automobile manufacturers learn from Formula 1 or lower production series models? What is the reality of carbon fiber use in automobiles beyond an annual production of 25,000 units? Can this possibly happen? Or will it take a new grade of carbon fiber, as stated by the DoE's Oak Ridge National Laboratory, or faster production processes, to compete with steel and aluminum stamping? What about offshore wind? And risers for deepwater oil platforms?

Is real demand still too tenuous to justify the new fiber volume? Are we going to embark on a new rollercoaster ride of fiber glut, falling prices, and then fiber shortages, with higher prices shutting out new product development and fear of future investment? What is the real projected supply and demand situation for carbon fiber now and in the future in this economic climate?

Attend Carbon Fiber 2009 and find out.



J. Scott Stephenson  
Conference Director

**Register Today!**

**2 Preconference Seminars Dec. 9th**

(separate fees required)

**Preconference Seminar 1 - Carbon Fiber for Tomorrow – A Review of Current Technologies and the Path to Wide Spread Industrial Growth**  
THE CARBON FIBER RESEARCH TEAM AT OAK RIDGE NATIONAL LABORATORY  
Dec. 9, 2009—8:00 am -12:00 pm

The elevated mechanical properties and low mass of carbon fiber make it an attractive potential material for a number of high volume applications. Industries with potential interest include automotive, wind energy, infrastructure, ground and sea based defense, bio-energy, oil and gas, bio-fuels and sporting goods. The high cost, low relative volumes available and inexperience of many industries with carbon fiber, present significant obstacles to incorporating this material in future structures. This short course will review how pitch, PAN and rayon based carbon fibers are currently used and common manufacturing methods for producing carbon fibers from these precursors. The course will then address individual market sectors that could see widespread penetration by carbon fiber composites and highlight some of the current obstacles to widespread adaptation for those industries. The course will next give a breakdown of where and what the costs are for producing PAN based carbon fiber and highlight on-going efforts, to reduce these costs. It will also explore other non-cost obstacles to incorporating carbon fiber in high volume industries and what is being done globally to address those.

**Instructors:** The instructor team is comprised of eight members of the carbon fiber research program at Oak Ridge National Laboratory, Oak Ridge, Tennessee.



**Lead Instructor:** C. David Warren is currently the Program Manager for Transportation Materials at Oak Ridge National Laboratory and Field Technical Manager for Materials in the Lightweighting Materials Program of DOE Vehicle Technologies. He has been at Oak Ridge National Laboratory working with composite materials for 18 years. Prior to joining ORNL in 1991, he was the program manager for Peacekeeper ICBM propulsion, Small ICBM basing and Rail Garrison support as a Captain in the United States Air Force. He has 54 technical publications mostly in composite materials development and application and vehicle technologies.

For full description, outline and bios of the other instructors, please visit <http://www.compositesworld.com/CF>

**Seminar 2 - The Opportunities for Carbon Fiber in Current and Emerging Markets**  
Pre-Conference Seminar 2 – Dec. 9, 2009 – 1:30-5:00 pm

The use of carbon fiber composites as measured by the volume of material attributed to finished composite structures is wide and diverse. Demand for raw carbon fiber in 2008 was approximately 32,000 MT – more than 13% higher than 2007 levels. Despite spending cuts in many sectors of the economy, over the next 10 years annual volume of carbon fiber-reinforced plastic (CFRP) composites produced around the world is expected to grow by nearly 300% over current levels. This seminar will provide a comprehensive global outlook for the demand for carbon fiber materials and services, with a dedicated section on the rapidly evolving Chinese carbon fiber composite industry, including manufacturers and market demands. The impact of these evolving markets will be analyzed in relation to carbon fiber supply chain, which has announced approximately \$2.5 billion in capacity expansion to meet demand through 2014.



**Instructor:** ANTHONY (TONY) ROBERTS has more than 40 years experience in the carbon fiber and advanced composites industries. From the 1970s to the 1990s, he was with Courtaulds Grafil (Coventry, U.K.), developing applications for carbon fiber in the aerospace, industrial and sporting goods sectors in Europe, Japan and Southeast Asia. He subsequently moved to Mitsubishi Rayon Co. Ltd., working in the U.S. as sales and marketing director for subsidiary companies Grafil Inc. and Newport Adhesives and Composites Inc. From 2005 to present, Roberts has served the industry as an independent consultant, working with a range of advanced materials and applications specializing in carbon fiber. He has prepared individual client studies and in 2006 produced a world carbon fiber marketing report. He has recently completed a strategic carbon fiber market evaluation: "The Carbon Fibre Industry Worldwide 2008 - 2014," which will focus on current markets and future supply and demand. Roberts is now involved as a marketing consultant for the Chinese carbon fiber industry.




**Instructor:** CHRIS RED, editor and vice president of market research at Composite Market Reports (CMR), has 12 years experience in producing research and developing market trends and forecasts related to the use of advanced composites. As head of CMR's market research and consultancy operations, Chris has also written and contributed to dozens of reports and projects on the topic of composites, manufacturers and competitive analysis. As editor for CMR he is responsible for keeping abreast of the advanced composites industry, selecting, researching and writing the company's two monthly composites newsletters. In addition to CMR's own publications, he is a frequent contributor to composite industry publications and is currently a contributing writer for *High-Performance Composites* and *Composites Technology* magazines.

# Conference Agenda

## Wednesday, December 9

8:00 **Preconference Seminar 1** (separate fee required):  
*Carbon Fiber for Tomorrow – A Review of Current Technologies and the Path to Wide Spread Industrial Growth The Carbon Fiber*  
 RESEARCH TEAM AT OAK RIDGE NATIONAL LABORATORY

1:30 **Preconference Seminar 2** (separate fee required):  
*The Opportunities for Carbon Fiber in Current and Emerging Markets*  
 CHRIS RED, Editor and Vice President of Market Research, Composite Market Reports  
 ANTHONY (TONY) J. ROBERTS, Principal, AJR Consultant LLC

6:00 **Registration and Opening Cocktail Reception**   
 (Sponsored by Harper International)  
 Check in for the conference and meet fellow attendees at this complimentary two-hour opening reception



## Thursday, December 10

7:30 **Registration and Continental Breakfast**  
 Enjoy a continental breakfast and informal discussion with your colleagues

8:30 **Welcome, Introductions and Conference Overview**  
 SCOTT STEPHENSON, Director, CompositesWorld Conferences  
 TOM LEMIRE, Western Regional Manager  
 Toho Tenax America Inc.  
 ANTHONY (TONY) ROBERTS, Principal, AJR Consultant LLC

### Keynote Presentation

9:00 **Will Composite Materials Be Attractive for the Next Generation Narrow-body Aircraft?**  
 JENS HINRICHSEN, Dipl.-Ing.  
 President, Aerospace Advisory Group, LLC

10:00 **Trends in Aerospace Composites Technologies and Manufacturing Processes (Invited)**  
 TIM SHUMATE, Marketing Manager, ATK Composites

10:30 **Refreshment Break** 


11:00 **Capital Markets Overview of the Carbon Fiber & Broader Composites Industry**  
 MICHAEL S. DEL PERO  
 Vice President – Plastics, Composites, & Advanced Materials  
 McGladrey Capital Markets LLC  

- Market summary: size and growth estimates
- Analysis of existing factors and emerging trends
- Past, present and future of capital markets and m&a activity
- Review of strategic alternatives and whether now is the right time to consider such alternatives

11:30 **High Performance Carbon/PPS Thermoplastic Composites in Aerospace**

MICHAEL R. FAVALORO  
 Technical Marketing - High Performance Polymers, Ticona  

- PPS Polymer Description and Properties
- Carbon/PPS Composites
  - Value Chain Discussion
  - Material Properties
  - Processes
  - Environmental Advantages as compared to Thermoset Composites
- Aerospace Applications for Carbon/PPS Composites
  - Commercial Aircraft Interior
  - Commercial Aircraft Exterior

12:00 **Informal Roundtable Luncheon**   
 Network with fellow delegates and enjoy a three-course luncheon


1:30 **Continuous Fiber Reinforced Thermoplastic Aerospace Applications**  
 JAMIE TEBAY, Product Manager LNP, Sabic Innovative Plastics  

- Weight and cost reduction for aerospace applications
- Trends, growth estimates and needs
- Short vs. long carbon fiber reinforcements
- Comparisons to traditional materials

2:00 **Prepreg Manufacturing Process for Composite Materials**  
 ROLF TRÖNDLE, Sales Manager, SANTEX AG  

- Prepreg—material of the future
- Market trends and opportunities
- Prepreg manufacturing technologies
- CAVITEC prepreg lines

2:30 **The World Offshore Wind Market**  
 STEVEN R. KOPITS, Energy Business Analyst, Douglas-Westwood


3:00 **Refreshment Break** 

3:30 **Technical Challenges and Opportunities for Incorporating Carbon Fiber into Large Blade Designs**  
 DAYTON A. GRIFFIN, Senior Engineer, Turbine Engineering  
 DNV Energy

4:00 **Design Advancements in Equipment and Integration to Prepare for the Next Generation of Carbon Fiber Production Facilities**  
 ROBERT BLACKMON, Vice President, Process Systems  
 Harper International Corporation

4:30 **Impacts and Effects of Carbon Fiber Export Control**  
 PAT MATSUMURA, Director, International Trade Compliance, Hexcel  
 BOB VARGA, Technical Sales Engineer, Export Compliance Officer  
 Toho Tenax America Inc.

5:00 **Conference Adjourns**

6:00 **Cocktail Reception**   
 Network with fellow participants and enjoy hors d'oeuvres at this cocktail reception.

## Friday, December 11

7:30 Continental Breakfast

8:15 **Midconference Summary and Announcements**  
SCOTT STEPHENSON, CompositesWorld Conferences  
TOM LEMIRE, Toho Tenax America Inc.  
ANTHONY (TONY) ROBERTS, AJR Consultant LLC

### Keynote Presentation

8:30 **Carbon Fiber Composites Research and Development at Automobili Lamborghini**  
MAURIZIO REGGIANI, Vice-president of R&D and CTO Automobili Lamborghini S.p.A., Sant'Agata Bolognese, Italy  
PAOLO FERABOLI, Professor and Director of the Automobili Lamborghini Composites Laboratory  
Department of Aeronautics & Astronautics  
University of Washington, Seattle, WA, USA  
(abridged abstract on back cover, full abstract can be seen at [www.compositesworld.com/cf](http://www.compositesworld.com/cf))

9:30 **Boom or Bust: Emerging Carbon Fiber Applications**  
SANJAY MAZUMDAR, CEO, Lucintel  
NORMAN TIMMINS, Director of Consulting, Lucintel

- Current early stage carbon fiber applications and projected demand over the next 5-8 years
- Nascent carbon fiber applications which may or may not have the potential to become established +5 years into the future. This presentation seeks to evaluate drivers and potential challenges in the adoption of carbon fiber by showcasing high growth emerging applications within a dynamic marketplace.

10:00 Refreshment Break 

10:30 **Carbon Fiber in Offshore Oil and Gas Applications**  
BRIAN E. SPENCER, President, Spencer Composites Corporation

- Risers used for exploration and production
- Transport vessels now being qualified for transporting both crude oil and gas
- Other developments

11:00 **Global Carbon Fiber Demand to Support the Growth of the Natural Gas Vehicle (NGV) Market by 2020**  
MALCOLM W. K. ROSENOW, Consultant


- Total number of natural gas vehicles worldwide/region/country
- Global estimate for the number of cng pressure vessels by 2020
- Challenges & threats to carbon fiber to support double digit growth
- Carbon fiber forecast: conservative/target/breakthrough assumptions

11:30 **Quasi-isotropic Hybrid Braid Materials for High-volume Applications**  
GEOFFREY M. WOOD, Profile Composites Inc.

- Product criteria
- Tooling criteria
- Supply and demand issues
- Selection of applicable materials

12:00 **Panel and Group Discussion:**  
*"Predicting the Future of Potentially Large Carbon Fiber Markets"*

- Automobile
- Next generation single-aisle commercial aircraft
- Wind, especially offshore
- Fuel storage and transport
- Deepwater oil

12:45 **Informal Roundtable Luncheon**  
Network with fellow delegates and enjoy a three-course meal. 

1:45 **Recent Developments in Microwave Curing of Carbon Fiber Composites**  
THOMAS HUNTER, President  
CHARLES SEGAL, Vice President, Advanced Planning  
Firebird Advanced Materials Inc.


- Faster cure times
- Lower energy required
- Competitive composites properties
- Lower cost?... time will tell

2:15 **Nanotechnology: The Next Generation for Carbon Fiber Composites**  
LANCE CRISCUOLO, President, Zyvex Performance Materials

- Carbon nanotubes
- Integrating them into carbon fiber composites
- Their benefits to the system
- Applications

2:45 **Lightweight, Tough Carbon – Innegra Hybrid Composites in Aerospace, Automotive and Sporting Goods Applications**  
BRIAN MORIN, CEO, Innegrity LLC

- Light, tough carbon innegra composites
- Aerospace applications (military helicopter and UAV)
- Automotive applications (F1 racing to production autos)
- Sporting goods (kayaks, surfboards and more)

3:15 Refreshment Break 

3:30 **Carbon Fiber Reinforced Thermoplastic Composite Applications**  
THOMAS SMITH  
President, Performance Materials Corporation

- Electronics (specifically computing)—a new opportunity for incremental carbon fiber growth

4:00 **Competing with an Edge**  
CHRISTINA HU  
Director, Engineering Marketing and Sales  
Acellant Technologies Inc

4:30 **Conference Summary and Conclusions**  
TOM LEMIRE, Toho Tenax America Inc.  
ANTHONY (TONY) ROBERTS, AJR Consultant LLC  
SCOTT STEPHENSON, CompositesWorld Conferences

# Register Today!

## Carbon Fiber 2009

is THE international conference for executives from leading fiber suppliers, end users, fiber converters, prepreggers, and composites parts manufacturers! Join your industry colleagues – technical directors, marketing executives, business development specialists and industry analysts - in lively discussion on the current supply and demand situation for carbon fiber as well as the future prospect for growth of new carbon fiber composite applications. Market opportunities, new technology, and production processes to streamline manufacturing and lower costs will also be explored. And we provide numerous networking opportunities at catered receptions, roundtable luncheons, and refreshment breaks.

Two can't miss preconference seminars will be presented on Dec. 9, focusing on the latest market developments and technology, including:

- **Preconference Seminar #1: Carbon Fiber for Tomorrow - A Review of Current Technologies and the Path to Wide Spread Industrial Growth**  
Presented by: David Warren / Program Manager / ORNL  
(with Mohamed Abdallah, Fred Baker, Nidia Gallego, Amit Naskar, Felix Paulauskas, Cliff Eberle and Soydan Ozcan)
- **Preconference Seminar #2: The Global Outlook for Carbon Fiber Composites: Expansion as a Result of Efficiency and Productivity**  
Presented by: Tony Roberts / Principal / AJR Consultant LLC  
Chris Red / Editor & VP Market Research / Composite Market Reports

PRE-  
CONFERENCE  
SEMINARS  
DEC 9

## The Hilton San Diego Bayfront Hotel

The West Coast's newest waterfront hotel. The hotel opens a front-door to San Diego's vibrant waterfront, providing unparalleled views and pedestrian access to the 4.3 acre waterfront park. The Hilton San Diego Bayfront is only a short walk from downtown San Diego's Gaslamp Quarter, and its many entertainment and recreational amenities as well as world-class shopping and dining. You're only minutes from the San Diego International Airport (SAN) and dozens of sightseeing and recreational opportunities including championship golf courses, glorious beaches, the world-famous San Diego Zoo and more. Spacious guest rooms offer breathtaking views of the city, across San Diego Bay, Coronado Island and the Coronado Bay Bridge and beyond to the Pacific Ocean.



### Hilton San Diego Bayfront

1 Park Blvd. | San Diego, CA 92101 USA | p: +1 619-564-3333 | f: +1 619-564-3344  
A limited number of rooms have been reserved for attendees at the discounted rate of \$139/night. To take advantage of this special offer, reservations must be made by November 18, 2009. Attendees are responsible for their own travel and hotel reservations.

## What attendees said about Carbon Fiber 2008

*"One of the most informative and open conferences I have attended. People willing to inform and keen to learn."*

- David Service, Bluestar Fibres

*"Even the most knowledgeable and experienced carbon fiber expert will gain new insights into the carbon fiber industry and market opportunities."*

- Fred Baker, Oak Ridge National Laboratory

*"Great venue, great speakers, great organization."*

- Jeff Cross, Advanced Composite Group

*"Excellent conference that gets to the heart of the carbon fiber industry."*

- Jason Carling, Toho Tenax

## Join us in San Diego for Carbon Fiber 2009!

### Payment, substitution and cancellation policies:

Payment is required in advance of the conference and includes conference proceedings, luncheons, refreshment breaks, access to exhibit area and networking receptions. A confirmation and invoice or receipt will be sent to you upon receipt of your registration. Please note: All conference presentations and materials will be in English. Registration fees are fully refundable if cancellations are made in writing by November 25, 2009. After this date a \$100 cancellation fee will be assessed. Substitutions may be made at any time at no additional charge.

### Sponsorships & exhibits

Carbon Fiber 2009 offers you a great opportunity to increase your visibility before a highly targeted and qualified audience of key decision makers. Sponsorships and exhibit space are still available for several conference functions. We also offer advertising opportunities in the conference proceedings. For details, please contact:

Ralph Jessie | Conference Manager | +1 207-221-6603 | [jessie@compositesworld.com](mailto:jessie@compositesworld.com)

## CARBON FIBER 2009

Please circle one: Mr. Mrs. Ms. Dr.

First/Last Name \_\_\_\_\_ Job Title \_\_\_\_\_

Organization Name \_\_\_\_\_

Address \_\_\_\_\_ Suite/Floor \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Postal Code/Country \_\_\_\_\_

Telephone No. \_\_\_\_\_ Fax No. \_\_\_\_\_ Email Address \_\_\_\_\_

### Registration Fees (US Dollars)

- EARLY BIRD REGISTRATION FEE (thru 11/13/09) US \$ 1395 \_\_\_\_\_
- Conference Registration Fee (after 11/13/09) US \$ 1495 \_\_\_\_\_
- Academic/Government Rate US \$ 895 \_\_\_\_\_
- Preconference Seminar #1 (Carbon Fiber for Tomorrow) US \$ 495 \_\_\_\_\_
- Preconference Seminar #2 (Carbon Fiber Market Outlook) US \$ 495 \_\_\_\_\_
- Seminar #1 and #2 (Combined - save \$200) US \$ 790 \_\_\_\_\_
- Conference Proceedings (for those who cannot attend) US \$ 995 \_\_\_\_\_
- Exhibit Table (includes 1 conference registration) US \$ 2500 \_\_\_\_\_
- Exhibit Table (without conference registration) US \$ 1500 \_\_\_\_\_

**TOTAL:** \_\_\_\_\_

### Payment Options

- Check enclosed (payable to Gardner Publications)
- Please bill me (all fees must be paid in advance of attendance)
- Bank wire transfer (details sent upon registration)
- Credit card (all major cards accepted)

Card No. \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_

Team Discounts are available for parties of 3 or more. • Please call for details: +1-207-221-6603 • Please Note: Preconference Seminars require a separate fee.

5 EASY WAYS TO REGISTER ►

+1 207-221-6603  
+1 207-221-5848

CompositesWorld Conferences  
PO Box 44 Yarmouth, ME 04096 USA

[www.compositesworld.com/cf](http://www.compositesworld.com/cf)  
[jessie@compositesworld.com](mailto:jessie@compositesworld.com)

# CARBON FIBER 2009

Hilton San Diego Bayfront Hotel | San Diego, CA USA

**KEYNOTE PRESENTATION: December 10th, 9:00 am**

## *Will Composite Materials Be Attractive for the Next Generation Narrow-body Aircraft?*

JENS HINRICHSEN, Dipl.-Ing, President, Aerospace Advisory Group LLC



The dominant players in the market for commercial aircraft business, Boeing and Airbus, are in the process of developing/certifying wide-body planes which are characterized by 50-60% composite material content. Without any doubt, the degree of complexity of fuselage structures challenges the engineering teams to the extreme with regards to weight and production cost. Despite the absence of a solid basis of experience with robustness of design solutions, manufacturing processes details and airline operations of large composite fuselage structures a projection for the Next Generation Narrow-body aircraft families will be presented, concentrating on two paramount aspects: The first one concentrates on damage tolerance requirements impacting structural weight while the second aspect outlines requirements for competitive cost levels with regards to Advanced Fiber Placement (AFP) technology.

**KEYNOTE PRESENTATION: December 11th, 8:30 am**

## *Carbon Fiber Composites Research and Development at Automobili Lamborghini*



MAURIZIO REGGIANI, Vice-president of R&D and CTO, Automobili Lamborghini S.p.A., Sant'Agata Bolognese, Italy

PAOLO FERABOLI, Professor and Director, Automobili Lamborghini Composites Laboratory, Department of Aeronautics & Astronautics, University of Washington, Seattle, WA, USA



*See this car on display  
at Carbon Fiber 2009!*

Since 2007, Automobili Lamborghini has been working in collaboration with the Department of Aeronautics & Astronautics at the University of Washington and with the Structures Technology group of Boeing Research & Technology in Seattle, WA for the development and assessment of new technologies for future vehicle systems.

To read the complete abstract, visit: [www.compositesworld.com/cf](http://www.compositesworld.com/cf)