



Photo Credit: Charleston Area CVB

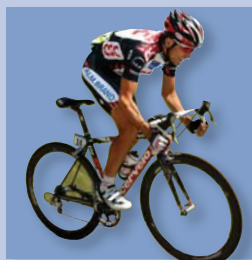
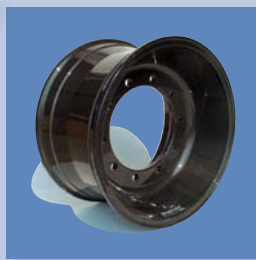
# 2008 CARBON FIBER

december 8.9.10

Charleston Marriott Hotel  
Charleston, SC USA

In association with:

HIGH-PERFORMANCE  
**Composites** **COMPOSITES**  
TECHNOLOGY



## Conference Co-Chairs:



**PETER W. OSWALD**  
Vice President of Marketing & Sales  
Toho Tenax America Inc.



**ANTHONY (TONY) J. ROBERTS**  
Principal, AJR Consultant LLC

## Keynote Presentation:

*Second Generation Materials:  
Carbon Fiber vs. Sponge Iron*

**ROB KLAWONN**  
President, Toho Tenax America Inc.

## Business Development Conference:

- 2 Pre-conference Seminars on December 8
- Over 20 Market & Technical Presentations by Industry Leaders

Sponsored by



## MARKET OVERVIEW

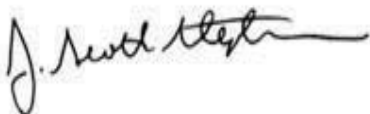
It was clear from our *Carbon Fiber 2007* conference that this market is being shaped by a number of forces. First is the unprecedented number of fiber capacity expansions that are underway. Every established supplier is building new lines and equipment to substantially increase supply. With an average 35 percent knockdown factor, small-tow fiber capacity at the end of 2007 was rated at 25,750 metric tonnes (55 million lb), and estimated to increase to nearly 44,000 metric tonnes (97 million lb) by 2014. New fiber lines will be more efficient than existing lines, and each probably will be dedicated to a single product. As a result, knockdown rates will gradually decrease, pushing that 44,000-metric-ton figure closer to 48,000. Large-tow capacity was estimated at 10,000 metric tonnes (22 million lb), and it should increase to 32,000 metric tonnes (71 million lb) by 2014, with an estimated 8 percent knockdown. Thus, the total combined small- and large-tow nameplate capacity by 2014 is predicted to be 98,350 metric tonnes (217 million lb). And while these figures include output from new startups in China as well as new players in Turkey, Canada, India and Saudi Arabia, those entities might increase their production more than anticipated, and other suppliers are likely to surface as well.

Is 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 fear of future investment?

It was the general consensus at *Carbon Fiber 2007* that market diversity today is much greater than in the 1990s when demand last tanked. That diversity is expected to ensure plenty of fiber demand for the next decade — a sure sign that the advanced composites market is maturing. However, with delays in some commercial aviation deliveries, and perhaps less carbon being consumed in the wind energy business than predicted a year ago, what is the true supply and demand situation for carbon fiber now and in the future?

Attend **Carbon Fiber 2008** and find out.

**Register today!**



J. Scott Stephenson  
Conference Director

## 2 Preconference Seminars: December 8th

(separate fees required)

### **Seminar 1 - The Outlook for Composites in Commercial Aircraft Structures and Interiors**

CHRIS RED, Editor and VP of Market Research, Composite Market Reports

Based on current delivery and backlog figures, more than 14,500 commercial jet transports will be delivered to airlines during the coming decade. During 2007, aircraft OEMs delivered nearly 1,150 transports — a figure which is expected to grow at an average annual rate of 3.3% between 2008 and 2017. Increasingly, aircraft OEMs and operators are adopting the use of advanced composites in both structural and interiors applications to reduce operating costs, increase time earning revenue and improve passenger comfort. This is driving the demand for composite aerostructures and interiors to grow by double-digits over the next several years and more than 120% over the next ten years.

This seminar is designed to provide a market analysis of the large commercial and smaller “regional” transport aircraft manufacturing industry, with a particular focus on the role of advanced composite materials (emphasizing carbon fiber reinforced plastics). Though not limited to the following topics, the program will provide specific details with regards to: market segmentation; new and anticipated production models, historic and forecasted deliveries (1995 – 2017); composite primary and secondary structural applications; composite aircraft interiors applications; “flyaway” and “buy weight” composite material requirements and forecasts.

**Instructor: CHRIS RED**, Editor and Vice President of Market Research, has 11 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.

### **Seminar 2 - When and Where Will Carbon Fiber Be Used & Precursor Outlook**

ANTHONY (TONY) J. ROBERTS, Principal, AJR Consultant LLC

CHRIS LEVAN, Manager of Technical Services, Carbon Fiber Solutions

In 2007, carbon fiber manufacturers announced investments of more than \$ 1.50 billion to increase global carbon fiber capacity from 52,000 tonnes in 2007 to 99,000 tonnes by 2014. Anticipated dynamic growth from the civil aerospace sector, along with industrial applications such as wind power and gas storage cylinders, have encouraged carbon fiber producers to make these large investments. This session will analyze the effects of delays of the Airbus A380 and Boeing 787 aircraft, assess new industrial applications, and review the impact of all end markets on carbon fiber demand, by volume and fiber type, for the period 2008 to 2014. The session will also cover the history of both PAN (polyacrylonitrile) and pitch precursor, including process and spinning technology, along with a survey of new product and precursor developments for carbon fiber.

**Instructor: ANTHONY (TONY) ROBERTS** has more than 40 years experience in the carbon fiber and advanced composites industry sectors. From the 1970s to the 1990s, he was with Courtaulds Grafil (Coventry, U.K.), developing the growth of applications for carbon fibers in the aerospace, industrial and sporting goods sectors. In this capacity, he spent considerable time in Europe, Japan and Southeast Asia, developing a comprehensive understanding of global markets for carbon fiber. 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 detailed individual client studies and in 2006 produced a detailed 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- demand.

**Instructor: CHRIS LEVAN** has been involved with the carbon fiber and composites business for more than 37 years. He started his career, while attending Cleveland State University, as a chemical intern at the Union Carbide Corp. - Carbon Products Div. research center in Parma, Ohio. After graduating as a chemist and chemical engineer, he worked full-time at the center in the carbon fiber development group where he served as a research and project engineer and, later, group leader for PAN fiber development. After the buyout by Amoco Chemical, he moved to the Alpharetta, Ga. research center and served as technical service manager, technology manager for pitch and product development and became active in SAMPE, The American Carbon Society, and the Advanced Center for Fibers and Films at Clemson University. When BP merged with Amoco and later sold the business to Cytec Engineered Materials, he continued as manager of technical service for Cytec Carbon Fibers for the next three years until establishing his own company in Alpharetta called Carbon Fiber Solutions. He holds numerous patents, his work has appeared in numerous publications and, in 1999, he won the BP Technology Breakthrough Award.

CONFERENCE AGENDA

Monday, December 8

8:30 **Preconference Seminar 1** (separate fee required):  
**The Outlook for Composites in Commercial Aircraft Structures and Interiors**  
CHRIS RED, Editor & Vice President of Market Research, Composite Market Reports

1:30 **Preconference Seminar 2** (separate fee required):  
**When and Where Will Carbon Fiber Be Used & Precursor Outlook**  
ANTHONY (TONY) J. ROBERTS, Principal  
AJR Consultant LLC  
CHRIS LEVAN, Manager of Technical Services  
Carbon Fiber Solutions

6:00 **Registration and Opening Reception**  
Check in and meet fellow attendees at this complimentary two-hour opening reception



Tuesday, December 9

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  
PETER W. OSWALD  
VP of Marketing & Sales, Toho Tenax America Inc.  
ANTHONY (TONY) J. ROBERTS  
Principal, AJR Consultant LLC

KEYNOTE PRESENTATION

9:00 **Second Generation Materials: Carbon Fiber vs. Sponge Iron**  
ROB KLAWONN  
President, Toho Tenax America Inc.  

- 1st generation glass fiber composites and pig iron-based steel
- 2nd generation carbon fiber composites and sponge iron-based steel; an interesting parallel is made
- Evolution of iron-making is compared with carbon fiber as a key base material
- Implications of future ironmaking capacities, economics and material forms could prove interesting for carbon fiber based composites

9:45 **The Carbon Fiber Industry: How and Why the Future Will Be Different than the Past**  
STEVEN CARMICHAEL  
Director of Sales & Marketing, Grafil Inc.

10:15 **Refreshment Break**



10:45 **The Impact of the Rising Price of Oil and of China on the Carbon Fiber Market**  
DAVID SERVICE  
Chief Executive Officer, Bluestar Fibres Company Ltd.

11:15 **How Do You Start a (Successful) Carbon Fiber Business?**  
DEE JAMES (D.J.) DELONG  
President, DeLong & Associates LLC  
MUSTAFA YILMAZ  
General Manager, AKSA Acrylic and Carbon Fibers

11:45 **Commercial Aircraft Market For Carbon Fiber, With Emphasis on Potential Growth in Aircraft Interiors - Particularly Seat Applications**  
BENJAMIN M. RASMUSSEN  
President, BMR Associates  

- Projected global growth to 2015
- Opportunities for component/specialist manufacturers
- Challenges for cf-tp seat applications
- What it means to save weight in aircraft interiors

12:15 **Informal Roundtable Luncheon**  
(Sponsored by Despatch Industries)  
Network with fellow delegates and enjoy a three-course luncheon



2:00 **Continuous Fiber Reinforced Thermoplastic Aerospace Applications**  
ARNT OFFRINGA  
Director R& D, Stork Fokker AESP BV  

- Cost-effective manufacturing
- Low-weight designs
- Fire safety
- Recyclability

2:30 **Recycling of Carbon Fiber: A Status Report on the Development of Processes for Reclaiming Useful Fiber from Factory Waste and Composite Waste from End-of-Life Composites**  
CHARLES (CHUCK) SEGAL, VP of Advanced Planning  
THOMAS (TOM) HUNTER, President  
Firebird Advanced Material, Inc.  

- Millions of pounds of carbon fiber waste (prepreg and composite) are going to landfills, worldwide
- Cost-effective methods of reclaiming the carbon fiber are still under development
- Collection and segregation of the waste at the source is a potential problem
- Developing suitable recycled fiber (other than for milling) may be a bigger problem
- Achieving a marketable price for the reclaimed fiber may be the biggest problem

3:00 **High Performance Pitch-based Carbon Fibers and Their Applications**  
HIDEYUKI OHNO  
General Manager, Nippon Graphite Fiber Corporation  

- Use of high-modulus fibers for industry applications
- High modulus fibers for thermal solutions
- Amorphous carbon fiber for high toughness and impact resistance
- Current outlook for pitch based CF

3:30 **Refreshment Break**



4:00 **Carbon Fiber Manufacturing, Oxidation Phase: Cost Effective Process Enhancements**  
HANS L. MELGAARD  
Chief Technology Officer, Despatch Industries  

- Fundamentals
- Factors that contribute to the cost effective production of oxidized carbon fiber
- Summary

4:30 **Emerging ITAR and Expanded EAR Regulation of Nano-composites**  
THOMAS R. GOLDBERG  
ATS, LLC

5:00 **Conference Adjourns**

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



12:15 **Informal Roundtable Luncheon**  
Network with fellow delegates and enjoy a three-course meal.



1:30 **Out of Autoclave Composite Processing for Aerospace Structures – Advances in Technology**  
CHRIS RIDGARD

- VP of Technology, Advanced Composites Group Inc.
- Advances in resin formulation technology combined with improved understanding of non-autoclave processes have combined to produce a new generation of structural materials
  - These offer the performance of traditional autoclave-processed materials but with the capability of being cured using lower-cost oven vacuum bag techniques
  - The history of out of autoclave processable materials since the early 1990's is reviewed and the possible impact of the latest generation materials on future aircraft structure manufacturing practices is examined

## Wednesday, December 10

7:30 **Continental Breakfast**

8:15 **Midconference Summary and Announcements**  
SCOTT STEPHENSON  
COMPOSITESWORLD Conferences  
PETER W. OSWALD, Toho Tenax America Inc.  
ANTHONY (TONY) J. ROBERTS, AJR Consultant LLC

8:30 **Wind Energy Market's Fast-expanding Use of Composites**  
WALTER V. THOMPSON  
President and CEO, Alternegy LLC

9:00 **Development of Inflatable Composite Bridge Arches**  
HABIB DAGHER  
Director, AEWU University of Maine

9:30 **The Use of Carbon Fiber for Automotive Mass Reduction**  
GARY R. LOWNSDALE  
Engineering Manager, Plasan Carbon Composites

10:00 **Refreshment Break**



10:30 **CNG Cylinders: A Cost-driven Commodity**  
DONALD A. FRASER  
Marketing Manager, Dynetek Industries Ltd.

- Markets for CNG cylinders – current and future
- Percentage of material costs for composite cylinders
- Target costs for carbon fiber

11:00 **Carbon Fiber Meets the Grid: Flywheel Energy Storage for Frequency Regulation**  
MATT POLIMENO  
Director of Government Programs, Beacon Power Corporation

- Overview of frequency regulation markets and market size
- Technical requirements & environmental advantages
- GEN4 Flywheel energy storage design w/ focus on the rim (2000 lb of composites spinning at 16K RPM)
- Other potential applications for flywheel energy storage

11:30 **Panel Discussion: "New Kids on the Block: How Will the Entrance of New Suppliers Affect the Carbon Fiber Market?"**

- Availability of technology (precursor and other)
- Licensing issues
- ITAR and METI restrictions
- Effect of regional energy prices (Is Iceland a viable plant location?)

2:00 **Pultruded Carbon Fiber Applications for UAVs and Other High-Performance Structures**  
JERRY FANUCCI  
President, KaZaK Composites Inc.

2:30 **Refreshment Break**



3:00 **Carbon Fiber in Thermoset Molding Compounds**  
MATT DOUGLASS  
Project Manager, Quantum Composites Inc.

- Quantum Composites overview
- Market summary
- Material types
- Future opportunities and challenges

3:30 **Carbon Nanotube Nonwoven Fabric for Composites**  
PETER ANTOINETTE  
President and CEO, Nanocomp Technologies Inc.

4:00 **Part Purpose Automation Machinery for the Manufacture of Composite Parts**  
JOHN MELILLI

- Vice President of Sales and Marketing, Accudyne Systems
- Market need for part-purpose machinery
  - Examples of equipment deployed
  - Conceptual equipment

4:30 **Conference Summary and Conclusions**  
PETER W. OSWALD, Toho Tenax America Inc.  
ANTHONY (TONY) J. ROBERTS, AJR Consultant LLC  
SCOTT STEPHENSON, COMPOSITESWORLD Conferences

Also, don't miss...

# 2009

## COMPOSITESWORLD'S INVESTMENT FORUM

february 26 & 27

The Roosevelt Hotel • New York, NY USA

# Register Today!

2 PRE-  
CONFERENCE  
SEMINARS  
DEC 8



Photo Credit: Charleston Area CVB

## Charleston, South Carolina

Rediscover your senses at the newly renovated Charleston Marriott Hotel, overlooking the Ashley River in historic Charleston, South Carolina. Enjoy a sensory dining experience at Saffire, serving innovative, American-fusion cuisine for breakfast, lunch and dinner. Visit Aqua Terrace, a rooftop lounge offering cocktails in a casual setting with brilliant views of the Ashley River. Unwind in our landscaped courtyard or workout in our state of the art fitness center with a panoramic view of our outdoor pool and whirlpool spa.

Charleston offers something for everyone. Golf and beaches, fine dining and world class shopping, historic architecture & notable buildings, all offered with Southern hospitality in a warm and friendly climate.

Join us in Charleston for Carbon Fiber 2008!

### Charleston Marriott® Hotel

170 Lockwood Boulevard

Charleston, South Carolina 29403 USA

Phone: +1 843-723-3000 • Fax: +1 843-266-1479

A limited number of discounted rooms have been reserved for attendees who make their reservations by November 7 at a rate of \$149 USD per night (single or double). Registrants are responsible for making their own hotel and travel reservations.

[www.compositesworld.com/cfhotel](http://www.compositesworld.com/cfhotel)

**To guarantee your place**, payment is required in advance of the conference. The conference proceedings, luncheons, refreshments breaks, access to exhibit area and receptions are included in your conference fee. 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.

**Substitutions & Cancellations:** Registrations fees are fully refundable if cancellations are made in writing by November 26. After this date, there is a \$100 cancellation fee. Substitutions may be made at any time at no additional charge.

If you are unable to attend, you can still take advantage of the information from the conference. Order the conference proceedings on CD-ROM and receive a complete set of all papers and speaker handouts presented at the meeting. To order, use the registration form or call:

**Ralph Jessie • USA +1 207-221-6603**

(Please note: Not available until after the event.)



## Sponsorships & Exhibits

A great opportunity to increase your visibility before a highly qualified audience of key decision makers. Sponsorships are still available for several conference functions. We also offer tabletop exhibit space and advertising in the conference proceedings. For details contact:

**Ralph Jessie • +1 207-221-6603 • [jessie@compositesworld.com](mailto:jessie@compositesworld.com)**

## 5 EASY WAYS TO REGISTER!

- USA +1 207-221-6603
- COMPOSITESWORLD Conferences  
PO Box 44 • Yarmouth, ME 04096 USA
- USA +1 207-221-5848
- [www.compositesworld.com/cf](http://www.compositesworld.com/cf)
- [jessie@compositesworld.com](mailto:jessie@compositesworld.com)

## CARBON FIBER 2008

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)

- |                                                                                     |                  |
|-------------------------------------------------------------------------------------|------------------|
| <input type="checkbox"/> EARLY BIRD REGISTRATION FEE (thru 10/30/08)                | US \$ 1395 _____ |
| <input type="checkbox"/> Conference Registration Fee (after 10/30/08)               | US \$ 1495 _____ |
| <input type="checkbox"/> Academic/Government Rate                                   | US \$ 895 _____  |
| <input type="checkbox"/> Preconference Seminar #1 ( <i>Composites in Aircraft</i> ) | US \$ 495 _____  |
| <input type="checkbox"/> Preconference Seminar #2 ( <i>Carbon Fiber Use</i> )       | US \$ 495 _____  |
| <input type="checkbox"/> Seminar #1 and #2 ( <i>Combined - Save \$200!</i> )        | US \$ 790 _____  |
| <input type="checkbox"/> Conference Proceedings (for those who cannot attend)       | US \$ 995 _____  |
| <input type="checkbox"/> Exhibit Table (includes 1 conference registration)         | US \$ 2500 _____ |
| <input type="checkbox"/> Exhibit Table (without conference registration)            | US \$ 1500 _____ |
| TOTAL:                                                                              | _____            |

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.

### 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 \_\_\_\_\_

© Copyright, 2008 CompositesWorld Conferences - a Division of Gardner Publications

# 2008 CARBON FIBER

December 8 . 9 . 10 • Charleston Marriott Hotel • Charleston, South Carolina, USA

Listen to what attendees said about  
COMPOSITESWORLD's  
**CARBON FIBER 2007** conference!

**COMPOSITESWORLD**  
conferences

PO Box 44  
162 Main Street  
Yarmouth, ME 04096 USA

Presorted Standard  
U.S. Postage  
Paid  
Portland, ME  
Permit No. 7

Time sensitive material

*"A great opportunity to see the broad range of applications for carbon fiber composites and speak with the leaders in the industry."*

Kara Sadlik, Cornell University

*"The variety of topics provided for a unique overview of market opportunities, application & material development and process innovation."*

Kevin Richardson, PPG Industries

*"Very well done!"*

Steve Lemery, Boeing

# 2008 CARBON FIBER

december 8.9.10

Charleston Marriott Hotel  
Charleston, SC USA

In association with:

HIGH-PERFORMANCE  
**Composites** **COMPOSITES**  
TECHNOLOGY