



NAFEMS - INDIA Symposium on

Composite Products from Concept Design to Manufacturing

24 & 25 July, 2009

SATISH DAWAN AUDITORIUM, IISc, Bangalore



Conference Thrust Areas

- Automated Manufacturing of Composites.
- Composites in Aerospace, Automotive, Construction and Energy.
- Design and Analysis of Complex Products.
- FEA for Composites.
- Fatigue, Fracture and Failure in Composites.
- Non-Destructive Testing of Composites.
- Optimal Design of Composite Structures.
- Metal Matrix Composites.
- Near net shaped castings of Composites.
- Software aids for Composite Design and Manufacturing Processes.
- Affordable High Performance Composites.
- Future Trends.

Co-organisers



The Institution of Engineers (India)
Karnataka State Centre



COMPOSITES TECHNOLOGY PARK



Media Partner



THE INTERNATIONAL ASSOCIATION FOR THE ENGINEERING ANALYSIS COMMUNITY

www.nafems.org/events

www.edafindia.org

Composite Products from Concept Design to Manufacturing

About the Symposium

Over the past three decades, the terminology of Composite Materials has been well acknowledged by the technical community. Composite Materials have been gaining exponential acceptance in diverse industries. They are serving as competitive substitutes for traditional structural and functional materials to realize current and future trends imposed on high performance structures. Striking examples are in the field of transportation vehicles (aircraft, space shuttle and automobile), civil infrastructure (buildings, interiors and highway barriers) and sporting goods (F1, golf club, sailboat) etc. This is rendered possible owing to an improved understanding of their performance characteristics, application, potentials, especially innovative and cost-effective manufacturing processes.

Composite Materials are strong, lightweight, and corrosion resistant, as well as expensive to manufacture and not widely used in large-scale industrial applications. The development of knowledge in application of composites used in the industry is an ongoing process. Considerable benefits offered by composites have yet to be fully exploited, as knowledge and understanding grow, composites will play an increasingly significant role. Lower composite manufacturing costs would accelerate this trend in cost-sensitive industrial mass markets.

Composite Materials are extensively used in automotive, aerospace and other allied industries because of their inherent advantages over the conventional metallic materials. There has been tremendous rise in the use of such materials in the last decade. This led to the research and development programme carried out globally in this field. In India number of R&D establishments, industries and academic institutions are actively engaged in research and development activities in the field of Composite Materials.

Present methods of manufacturing composites are too labor intensive or too product specific to work efficiently. Design for Manufacturing (DFM) approach integrating best practices of the manufacturing process should be introduced in design so that the best product can be produced in a shortest possible time with limited resources. One major goal is to reduce the cost of manufacturing while optimizing overall performance of the product.

The symposium is focused to help the participants:

- To develop the basic skills required for the overall appreciation of composite product development process
- Learn the analysis to do a quick check on the preliminary design
- To perform detailed analysis and optimize the critical zones of the structure
- To develop the overview of manufacturing techniques required for becoming a good designer and analyst

Importance of symposium for the organisations using Composites

- Obtain full insight and information on cutting edge technology in the industry
- Network with experts and peers in the area of Composites
- Understanding of accurate manufacturing techniques of Complex / large composite parts including products manufactured in multiple stages
- Gain a better understanding of proper techniques and applications that can be used in daily operations
- Have your specific questions answered and problems solved by experts

Who Should Participate?

- Engineers and Professionals from Industries, Government Establishments and Service Sectors
- Faculty / Research Scholars / Students from Academic Institutions
- Scientists / Researchers / Engineers from R&D Establishments
- Professionals working or interested in the areas related to theme of the symposium

About NAFEMS

NAFEMS is the world's premier organization with 25 years of expertise in Composite and CAD/ CAE, publishing high quality books on Composites and training for analysts. NAFEMS has provided new vistas to several International Organizations in domains such as Composite, Dynamics, Optimization, Multiphysics, Heat Transfer, Non-linear Analysis, Electro Magnetics, Process simulation, Biomechanics and CFD. The humongous work of NAFEMS can be seen on www.nafems.org. NAFEMS Membership exceeds 900 Corporate members from over 35 different countries. Members range from major corporations such as Boeing through mid-sized Organizations such as JCB, to small-scale engineering consultants.

Sponsorship / Exhibitor

Sponsorship of this Symposium offers an unique opportunity to be directly identified with this prestigious event and provides maximum exposure to a top-notch audience of professionals, in a business conducive environment.

An exhibition is also scheduled alongside the symposium. While showcasing trend setting technological developments in the Industry, this event provides a clear picture of the innovative effort put in by the Industries in terms of cost competitiveness, quality, reliability and productivity.

Souvenir

A Souvenir will be brought out during this Symposium which will be distributed to the Delegates / Exhibitors / Sponsors/ Speakers/ Invited Guests/Members of supporting Professional Bodies/ Supporting Educational & Govt. Institutions/ Exhibition visitors. The Souvenir will contain contact, details and profile of all Sponsors & Exhibitors and profile of Keynote Speakers along with other details of the Symposium.

Symposium Topics

Basic Introduction

- Basics of Composite Materials
- Strength and stiffness

Classical Lamination Theory

- Stiffness matrix
- Stress Analysis
- Stress state in a laminate
- Strength Analysis
- Failure Criteria
- Ultimate strengths of unidirectional layers
- Failure modes
- Safety Factors
- Margins of Safety

Composite Joints

- Fittings and joints
- Bolted joints
- Design of bolted joints
- Riveted joints
- Adhesive bonded joints
- Design of adhesive bonded joints

Delamination

- Interlaminar Stresses
- Delamination

Sandwich Structures

- Rule to design and efficient sandwich structure
- Characteristics of core
- Core materials - Properties
- Conditions to be met by a good sandwich structure
- Bond line
- Face materials
- Failure modes

Bending and Buckling Analysis

- Problems on Bending and Buckling

Finite Element Analysis

- FEA considerations

Testing

- Testing Rig
- Conversion of pressure loads to test loads
- Analysis for test loads
- Strain gauging
- Testing Process
- Analysis-Test correlation

Manufacturing Processes

- Basic Manufacturing Processes

Call for Papers

Papers are invited on all aspects and topics of Symposium. Authors can email the abstracts to compositepapers09@gmail.com, on or before 14 July, 2009 to the Symposium Convener.

Authors will have to register as delegates to present selected paper/s. All papers will be published for distribution at the Symposium.

Keynote Speakers

Speakers with rich professional and research expertise in the field of Engineering Composite materials and its applications, would address the participants. A few of the Speakers are

Dr. H.V. Lakshminarayana
Professor, Dept. of Mechanical Engineering
Dayanand Sagar College of Engineering
Bangalore

Mr. S.S. Subramanya Sastry
Lead Consultant, InfoTech Enterprises Ltd
Bangalore

Dr. S. Sridhara Murthy
Joint Head, Structural Technology Division
NAL, Bangalore

Dr. V. Ramachandra
Scientist, Advanced Composites Division
NAL, Bangalore

Dr. Ramesh Sundaram
Scientist, Advanced Composites Division
NAL, Bangalore

Dr.R. Gopalan
Executive Director,
Composite Technology Park, Bangalore

Advisory Committee

Padmashree Prof. R. M. Vasagam
Former Vice Chancellor, Anna University,
Chennai

Dr. L. V. Muralikrishna Reddy
Chairman, Indian Institution of Engineers(I),
KSC, Bangalore

Mr. Santosh Mishra
Director operations, Avson India Pvt. Ltd.,
Pune

Mr. Nitin Metkar
Huntsman Advanced Material Ltd., Mumbai

Dr. U. Chandrashekar
Scientist 'F', Project Director,
GTRE, DRDO, Bangalore

Dr. K. Gopla Krishnan
Sponsored Project Research Director,
Anna University, Coimbatore

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Please write in BLOCK LETTERS

Name: _____

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Tel: () _____ Fax: () _____

The provisional title of my paper is: _____

PAYMENT DETAILS

Amount: _____ Cheque/Draft No: _____

Bank: _____ Dated: _____

Date: _____

Signature

Register Now

For Symposium details on Sponsorship/Exhibition/Registration contact:

Dr. K. Elangovan (99168 54580)

Mr. Mahesh R (98450 18715)

Ms. Ashwini N (97435 36066)

Tel : +91 - 80 - 40936683

Fax : +91 - 80 - 25352945

E-mail : nafemscomposites@gmail.com

For queries related to Paper Presentation, Please Email:

Compositpapers09@gmail.com

Date : 24-25 July, 2009

Symposium Venue: Satish Dawan Auditorium,
Ilsc, Bangalore

Registration Fee

Industry / R&D Labs -Rs. 5,000/-

NAFEMS / EDAF Members -Rs. 3,000/-

Academic Participants -Rs. 2,000/-

Group concession for 5 or more participants.

Registration fee is payable as a cheque / DD in favour of 'Symposium on Composites' payable at Bangalore and send to Symposium Convener.

Registration fee is inclusive of Symposium Kit, Lunch and Tea

Symposium Convener:

Dr. H. V. Lakshminarayana
#31, 2nd Cross, 2nd Stage, 10th Main,
Indiranagar, Bangalore - 560 038.

Contact Details :

#17, First Floor, 2nd Main, 2nd Stage, Domlur, Bangalore - 560 071.

T +91-80-41152496 / 65592501 F +91-80-25352945 E nafemsindia@gmail.com W nafems.org

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