

NAFEMS Technical Working Group Overview

Composites Working Group (CWG)
2019

Composites (CWG)

- The NAFEMS Composites Working Group was formed in 2010, following strong demand from within the NAFEMS membership for a high level of activities related to the application of numerical methods to the analysis and assessment of composite materials.
- The goal of the working group is to act as the focal point for all of NAFEMS activities relating to composite materials and to spearhead the development of guidelines which will be of high value to industrial practitioners working in the field.
- The group meets on the 2nd Wednesday of each month online via WebEx.
- **CWG Chair** – Ronald Krueger, National Institute of Aerospace
- **CWG Vice-Chair** – Roger Assaker, e-Xstream engineering SA/ MSC.Software
- **CWG Vice-Chair** - Kim Parnell, PEC - Parnell Engineering and Consulting
- The group includes representatives of Airbus, Autodesk, Altair, Convergent, Delft University of Technology, DYNAmore, Embraer, ESI Group, e-Xstream engineering, Fachhochschule Nordwestschweiz Switzerland (FHNW), FETraining, German Aerospace, Institute of Composite Structures and Adaptive Systems, University of Liege, MDAO Technology, MSC.Software, MultiMechanics, National Composites Centre, National Institute of Aerospace, Parnell Engineering and Consulting, Penso, Purdue University, Siemens, IRT Saint Exupéry, Teton Composites, University of Bristol, University of British Columbia, Western New England University.
- Information about the Composites Working Group can be found on the NAFEMS website at www.nafems.org/community/working-groups/composites/
- To enquire about joining this working group complete the online form at www.nafems.org/community/working-groups/composites/get_involved/

Composites (CWG)

- **Current topics of interest**

- Draft “How to Obtain Material Properties for Structural Analysis of Composites” - under review
- Publication "FEA of Composite Materials: A review of engineering requirements and current facilities" - concept

- **Recent Activities**

- NAFEMS benchmark magazine with 10 articles focussed on composites, June 2015
- Review of Composites Simulation Tools – online review on NAFEMS Website
- Composite Finite Element Analysis, NAFEMS e-Learning course
- Structure Genome: A Revolutionary Multiscale Approach to Bridging Materials Genome and Structural Analysis, NAFEMS Webinar 2017

- **Recently Supported Events**

- JEC Paris, June 2016, Paris, France
- Experience Composites 2016, JEC, September 2016, Augsburg, Germany
- NAFEMS - Practicalities of Analysing Composites, September 2016, Coventry, UK
- American Society for Composites, September 2016, Williamsburg, USA
- Simulation von Composites – Bereit für Industrie 4.0, October 2016, Hamburg, Germany
- SAMPE, May 2017, Seattle, USA

Composites (CWG)

- **Technical area**

- The NAFEMS Composites Working working group is the focal point for NAFEMS activities related to composite materials. The expertise of the group is on the analysis of fiber reinforced materials. This includes continuous fiber reinforcements made of carbon, glass and aramid fibers as well as woven fabrics, long and short fibers. The matrix material is typically a thermoplastic or thermoset polymer.

- **Key achievements:**

- SAMPE, May 2017, Seattle, USA
- American Society for Composites 32nd Technical Conference, October 2017, West Lafayette, IN, USA
- *NAFEMS Composites Simulation Review: Volume 1, 2018* – available for download to NAFEMS members

- **Current activities:**

- Publication "How to Obtain Material Properties for Structural Analysis of Composites" – under review
- Publication "FEA of Composite Materials: A review of engineering requirements and current facilities" - concept
- *NAFEMS Composites Simulation Review: Volume 2* – papers under review
- Revision and update of PSE statements

- **Future plans**

- Call2Tender "How to Obtain Material Properties for Structural Analysis of Composites"
- New Composites survey in collaboration with Manufacturing Working Group

Chair Bio

Dr. Krueger currently holds the position of an Associate Research Fellow at the National Institute of Aerospace (NIA), which he joined in January 2003. He is involved in the development of durability and damage tolerance analyses for composite structures using finite element analysis and fracture mechanics. Dr. Krueger is an accomplished presenter and awarded author of over 60 technical papers published in refereed journals and international conference proceedings.

Dr. Krueger received both his Diploma and his Doctorate degree in Aerospace Engineering from the University of Stuttgart, Germany, in 1989 and 1996, respectively, where he worked as a research and teaching assistant at the Institute for Statics and Dynamics of Aerospace Structures. From August 2000 until December 2002 he worked as a Staff Scientist at ICASE located at NASA Langley Research Center. Prior to joining ICASE Dr. Krueger held a NRC Post-Doctoral research position at NASA Langley Research Center.

Dr. Krueger is an Associate Fellow of the American Institute for Aeronautics and Astronautics (AIAA). He currently serves as chairman of ASTM International Committee D-30 on Composite Materials. Further, he serves as co-chair of the Disbonding and Delamination Task Group within Composites Materials Handbook-17 (CMH-17).

