

Fact Sheet

Joint Center of Excellence for Advanced Materials (JAMS)

The Joint Center of Excellence (COE) for Advanced Materials (JAMS) was established in January 2004 to assist in ensuring the safe and reliable application of composites and advanced materials to commercial aircraft. The Center is a joint effort of the Center of Excellence for Composite and Advanced Materials (CECAM) led by Wichita State University and the Center of Excellence for Advanced Materials in Transport Aircraft Structures (AMTAS) led by the University of Washington. The COE is a leader in international coordination of research, development, and standardization for structures constructed from these new materials.

The common goal of this joint center, as with the other COEs, is to create a costsharing academic, industrial, and governmental partnership. The members are forging a union between the public sector, the private sector and academic institutions to create a world-class capability to identify solutions for existing and potential advanced materials and structures issues.

The main focus of this partnership is the research, engineering and development of information used to assure safety and standardize certification of existing and emerging structural applications of composites and advanced materials. Specifically, projects include the evaluation of past applications, performance of applied research and the development of standard engineering practices.

This Joint Center of Excellence, working with industry and government, also plays an important role in technology transfer, training, and continuing education for the aircraft industry and regulators. The group strives for international standardization; develops consensus for developed protocols; identifies standardized criteria for material and process control; and promotes shared material databases worldwide. COE members and industry affiliates have provided more than \$15M in matching contributions.

Current JAMS Projects include:

- Impact Damage Formation on Composite Aircraft Structures
- Certification by Analysis I and II / Composite Material Modeling
- Damage Tolerance Testing and Analysis Protocols for Full-Scale Composite Airframe Structures under Repeated Loading
- Environmental Factor Influence on Composite Design and Certification
- CACRC Depot Bonded Repair Investigation – Round Robin Testing
- Development of Dynamic Mechanical Analyzer (DMA) Calibration & Testing Procedures

- Improving Adhesive Bonding of Composites through Surface Characterization
- Development of Analysis/Test Certification Protocol for Crashworthiness of Composite-Intensive Commercial Transport Fuselage
- Certification of Discontinuous Composite Material Forms for Aircraft Structures
- Failure of Notched Laminates under Out-of-Plane Bending
- Effect of Surface Contamination on Composite Bond Integrity and Durability
- Development and Evaluation of Fracture Mechanics Test Methods for Sandwich Composites
- Durability of Adhesively Bonded Joints For Aircraft Structures
- Damage Tolerance Test Method Development for Sandwich Composites

Established: 2004

Sponsor: Office of Airport and Aircraft Safety R&D Division

Web: www.jams-coe.org

Technology Areas / Past Projects:

- Material Standardization and Shared Databases
- Bonded Structures
- Structural Substantiation
- Damage Tolerance and Durability Maintenance Practices
- Advanced Material Forms and Processes
- Unique Advanced Materials Cabin Safety Issues
- Life Management of Materials for Improved Aircraft Maintenance Practices
- Nanotechnology for Composite Structures
- Development of Reliability Based Damage Tolerant Structural Design Methodology
- Evaluation of Friction Stir Weld Process and Properties for Aerospace Application
- Fluid Ingression Damage Mechanism in Composite Sandwich Structures
- Identification and Validation of Analytical Chemistry Methods for Detecting Composite Surface Contamination and Moisture
- Inverse/Optimal Thermal Repair of Composites
- Methods for the Evaluation of the Fitness of Fiber Reinforced Composite Surfaces for Subsequent Adhesive Bonding
- Production Control Effect on Composite Material Quality and Stability
- Standardization of Analytical and Experimental Methods for Crashworthiness Energy Absorption of Composite Materials
- Statistical Analysis Program for Generating Material Allowables
- Structure Health Monitoring for Life Management of Aircraft
- Training Strategy Development - Composite Materials Education for Aircraft Practitioners
- Technology Assessment of the Airworthiness of Unmanned Aerial Systems

CECAM Director/University Lead:

John Tomblin, Ph.D., Executive Director
National Institute for Aviation Research
Wichita State University

C:\Users\509088\Documents\FAA\TORP
1339\coe\COE_Fact_Sheets_10222012\2012_Fact_Sheet_-_JAMS.doc
10/22/2012

Phone: (316) 978-5234
Email: john.tomblin@wichita.edu

CECAM Members:

Wichita State University
Northwestern University
Purdue University
University of Delaware
University of California at Los Angeles
Tuskegee University

AMTAS Director/University Lead:

Mark E. Tuttle, Ph.D.
Professor, Mechanical Engineering
University of Washington
Phone: (206) 685-6665
Email: tuttle@u.washington.edu

AMTAS Members:

Washington State University
Oregon State University
Florida International University
University of Utah
Edmonds Community College

FAA Program Manager:

Curtis Davies
William J. Hughes Technical Center
Phone: (609) 485-8758
Email: curtis.davies@faa.gov