

# SAE 2012 Aerospace Manufacturing and Automated Fastening Conference & Exhibition

## Technical Session Schedule

As of 09/24/2012 07:40 pm

### Tuesday, September 18

#### Manufacturing/Materials/Structures - Panel Discussion on the Economics of Composites

**Session Code:** AMAF215

**Room 201A,B,C**

**Session Time:** 10:00 a.m.

Making the change from metals to composites for aircraft structure is never an easy decision. There are several issues to consider when making this change. The economics involved with changing to composite materials is usually a primary consideration. This Panel will feature experts that have been involved with the decision process required when changing from metals to composites.

**Organizers -** Carroll G. Grant, Aerospace Composites Consulting; Jeffrey Morgan, Boeing

**Moderators -** Carroll G. Grant, Aerospace Composites Consulting

**Panelists -** Vernon M. Benson, ATK Aerospace; George Nicholas Bullen, Smart Blades Inc.; Dan Day, Boeing; Don A. Kinard, Lockheed Martin Aeronautics Co.;

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### Tuesday, September 18

#### Auto Fastening / Assembly & Tooling (AeroFast) - Large Component Assembly Sub-Assembly, Major Section Join and Final Assembly

**Session Code:** AMAF105

**Room 202A**

**Session Time:** 10:00 a.m.

This session will focus on the latest techniques and technologies for automated drilling and fastening systems as well as alignment and joining of large structural components such as major section or large component sub-assembly.

**Organizers -** Mark W. Smith, Lockheed Martin Aeronautics Co.; Paul Thompson, Electroimpact Inc.

Time	Paper No.	Title
10:00 a.m.	2012-01-1850	<b>Offset Fastening Flex Track</b> Cody Brown, Electroimpact, Inc.
10:30 a.m.	2012-01-1851	<b>Mating Aircraft Using Flexible Tooling via the Digital Thread</b> Roger C. Richardson, Delta Sigma Company
11:00 a.m.	2012-01-1853	<b>Sharklet Brings New Technology to Electroimpact E4000 LVER Machine</b> Carter L. Boad, Paul Haworth, Electroimpact Inc.
11:30 a.m.	2012-01-1852 ORAL ONLY	<b>Legacy 500 Fuselage Mating: An Innovative Automated Concept Approach</b> Andrea Agricola, Carlos Jose Venturoso, Rodrigo Santiago Alvarenga, Gustavo Guimaraes, Embraer-Empresa Brasileira de Aeronautica

The papers in this session are available in SAE Technical Paper Collection, COLL-TP-00314, and also individually. To purchase visit [collections.sae.org](http://collections.sae.org)

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### Tuesday, September 18

#### Auto Fastening / Assembly & Tooling (AeroFast) - Automated Robotic Drilling and Fastening

## Systems

**Session Code:** AMAF101

**Room 202A**

**Session Time:** 1:00 p.m.

This session is dedicated to the advancements in automation in the fields of drilling and fastening applications. In recent years tremendous improvement has been achieved in these fields as new system concepts such as 6-axis anthropomorphic robots, crawler robots, and Parallel Kinematic Machines. This session also includes innovative end-effectors including orbital drilling, vision systems, and fastener installation and new system architecture.

**Organizers -** Ken Benczkowski, Broetje Automation USA Inc.; Mark W. Smith, Lockheed Martin Aeronautics Co.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2012-01-1857	<b>Semi-Automated Fastener Installation for Cases When Full Automation is Not Practical</b> <i>Roger C. Richardson, Tom Stewart, Delta Sigma Company</i>
1:30 p.m.	2012-01-1858	<b>Development of a Robotic End-Effector of Drilling and Fasteners Inserter for Aircraft Structures</b> <i>Carlos C. A. Eguti, Luis Gonzaga Trabasso, Emilia Villani, Guilherme K. Coracini, Luis Fernando F. Furtado, Aeronautics Institute Of Technology</i>
2:00 p.m.	2012-01-1859	<b>5-Axis Flex Track System</b> <i>Brian Seater, Electroimpact Inc.</i>
2:30 p.m.	ORAL ONLY	<b>Dual, High Accuracy Robots for One Up Assembly of Metallic Aerostructures</b> <i>Eric Howell, Electroimpact Inc.</i>
3:00 p.m.	2012-01-1860	<b>Measurement Method for Evaluating Normal Direction of Surface for Digital Drilling and Riveting</b> <i>ZhaoCai DU, Yanbin YAO, AVIC Beijing Aero Mfg Tech Res Inst.</i>

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## Tuesday, September 18

### Auto Fastening / Assembly & Tooling (AeroFast) - Hybrid Metal / Composite Drilling and Assembly

**Session Code:** AMAF107

**Room 202A**

**Session Time:** 3:30 p.m.

The need for more innovative technologies towards lowering the cost and cycle time for drilling, fastening, and assembly of hybrid metal/composite structures has created a sense of urgency in the airplane manufacturing field. This session covers methods, tools, and technologies to enable manufacturability of hybrid joints while factoring in the most economical methods. Tools and techniques to improve drilling and assembly of the hybrid metal/composite will be addressed.

**Organizers -** Anthony S. Goddard, GEMCOR; Mark W. Smith, Lockheed Martin Aeronautics Co.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
3:30 p.m.	2012-01-1865	<b>New Concept on Drills Up To 5/8" (16mm) for One Shot IT8 Robot Application</b> <i>Peter Mueller-Hummel, Mapal Inc.; Christian Meiners, Broetje-Automation GmbH</i>
4:00 p.m.	2012-01-1866	<b>Major Breakthrough in Multi Material Drilling, Using Low Frequency Axial Vibration Assistance</b> <i>Sylvain Laporte, Côme De Castelbajac, MITIS</i>

<b>4:30 p.m.</b>	<b>ORAL ONLY</b>	<b>Portable Drilling &amp; Assembly Automation</b> <i>Karl-Erik Neumann, Exechon AB</i>
<b>5:00 p.m.</b>	<b>2012-01-1867</b>	<b>The Interference-Fit Bolted Joining of Hybrid Metal/Composite</b> <i>Qingyun Zhao, Yu Lei, Liu Huadong, Liu Fenglei, Ren Chong, Beijing Aeronautical Mfg Tech. Res. Inst.</i>

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Advanced Robotics Applications

**Session Code:**     **AMAF209**

**Room 202B**

**Session Time:**     **10:00 a.m.**

This session will address robotics and automation as key factors in aerospace advancement. Hear case-studies on the latest advancement in application of robot accuracy and how to measure robot accuracy.

**Organizers -**     *Scott Gillette, Northrop Grumman Aerospace Systems; Jeffrey Morgan, Boeing; Claude Perron, National Research Council*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>ORAL ONLY</b>	<b>Vision Guided Robotic Part Marking System</b> <i>David Siedal, Lockheed Martin</i>
<b>10:30 a.m.</b>	<b>ORAL ONLY</b>	<b>Precision Robotic Tool Placement Using Structured Light</b> <i>Matt Sodergren, Lockheed Martin Aeronautics; Rick Luepke, Lockheed Martin</i>
<b>11:00 a.m.</b>	<b>2012-01-1854</b>	<b>Developing Robotic Sealing Processes in Aerospace Manufacturing</b> <i>Arthur Paul Scafe, Encore Automation</i>

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Lean Manufacturing, Six Sigma & Supply Chain

**Session Code:**     **AMAF207**

**Room 202B**

**Session Time:**     **1:00 p.m.**

This session will address the use of Lean Tools and Techniques in aerospace manufacturing. Attendees will also hear case-studies on Lean Implementation and the application of the hybrid technique of Lean Six Sigma in the aerospace industry. Lastly, this session will address the issues of Supply Chain (the 4 Ws) and the Dynamics of Supply Chain that are involved when dealing in a global manufacturing environment.

**Organizers -**     *Benny J. Leppert, Jeffrey Morgan, Boeing; Kevin Sweeney, Boeing Commercial Airplanes*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>1:00 p.m.</b>	<b>ORAL ONLY</b>	<b>Materials Management Operations &amp; Wireless Electronic Kan-Ban</b>  <i>John Fulton, Zebra Technologies Corp.</i>
<b>1:30 p.m.</b>	<b>ORAL ONLY</b>	<b>Efficient Trailer Moves in the Yard via Automation</b> <i>David T. Phillips, Zebra Technologies Corp.</i>

- 2:00 p.m.**      **ORAL ONLY**      **Turn Key Assembly System Supplier Management**  
Joerg Bunke, ThyssenKrupp System Engineering
- 2:30 p.m.**      **ORAL ONLY**      **The People Side of Lean: Increasing Productivity, Safety, and Quality by Engaging Employees**  
Jo Matthews Umberger, Umberger Development Partners Inc.

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Metals, Fabrication and Processing (Part 1 of 2)

**Session Code:**      **AMAF203**

**Room 202B**

**Session Time:**      **3:30 p.m.**

Advancements in the production of metallic structure continue to be important to the aerospace and commercial aviation industries. This session features improved materials, processes, and joining methods for metallic components to meet the challenges put forth by demanding end product requirements.

**Organizers -**      Benny J. Leppert, Jeffrey Morgan, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>3:30 p.m.</b>	<b>2012-01-1877</b>	<b>High Performance Spindle Systems for Heavy Duty Milling of Difficult-To-Cut Aerospace Materials</b> Masakazu Soshi, Shinji Ishii, Mori Seiki Co., Ltd.; Peter Fonda, Kazuo Yamazaki, University of California Davis
<b>4:00 p.m.</b>	<b>2012-01-1868</b>	<b>Effects of Controlled Modulation on Surface Textures in Deep-Hole Drilling</b> J B Mann, M4 Sciences LLC; C J Saldana, Pennsylvania State University; Y Guo, H Yeung, W D Compton, S Chandrasekar, Purdue University
<b>4:30 p.m.</b>	<b>2012-01-1878</b>	<b>Increasing Competitiveness in Structural Assembly by using Solid-State Spot Welding (Friction Spot Welding and Friction Stir Spot Welding) as a Replacement of Traditional Fasteners and Rivets?</b> Henry Hameister, Helmut Schmidt University
<b>5:00 p.m.</b>	<b>ORAL ONLY</b>	<b>EDM Fastener Removal</b> Kelly Brianne Sansom, Lockheed Martin Aeronautics Co.

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Aircraft Coatings Technologies

**Session Code:**      **AMAF213**

**Room 202D**

**Session Time:**      **10:00 a.m.**

The focus of this session is on the issues critical to successful coating application and measurement in aerospace application. Topics include but are not limited to: Robotic Coatings Applications, Non-Spray Specialty Coatings, Measurement Technologies and Performance Structure Manufacturing.

**Organizers -**      Jeffrey Morgan, Richard Wire, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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10:00 a.m.	ORAL ONLY	<b>Robotic Part Coating System (RPCS)</b> <i>Ron Franks, Lockheed Martin Aeronautics Co.</i>
10:30 a.m.	2012-01-1855	<b>Automated Painting for Aerospace, Challenges, Newer Technologies and Lessons Learned</b> <i>Steven Allen Becroft, Encore Automation</i>

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Metrology Automated Systems (Part 1 of 2)

**Session Code:**     **AMAF205**

**Room 202D**

**Session Time:**     **1:00 p.m.**

Metrology and automation control system developments have progressed significantly in recent years. This session will present and discuss the application and potential applications of these systems in aerospace manufacture. It features system developments in metrology for machine control, accuracy enhancement and system performance evaluation to meet the demands of new aircraft programs.

**Organizers -**     *Eric Barnes, Northrop Grumman; Phil Crothers, Boeing Research & Technology; Roger Holden, Metris UK; Jeffrey Morgan, Boeing; Todd Szallay, Northrop Grumman Corp.*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	ORAL ONLY	<b>Digitizing the Thread: Non-Contact Metrology Applications Development for the F-35</b>  <i>Christopher Barrow, Lockheed Martin Aeronautics</i>
1:30 p.m.	ORAL ONLY	<b>Automated Inspection of Large Unconstrained Parts</b> <i>Qing Wang, Durham Univ.; Roger Holden, Neil Brady, Paul Lightowler, Nikon Metrology</i>
2:00 p.m.	ORAL ONLY	<b>Flexible Automation Systems Augmented by Metrology in Aerospace</b> <i>Roger Holden, Paul Lightowler, Nikon Metrology</i>
	2012-01-1861	<b>Meeting Challenges of Key Characteristics (KC) Measurements in Aerospace Manufacturing (Written Only -- No Oral Presentation)</b> <i>Kumun Vakil, Northrop Grumman Corp.</i>

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Metrology Automated Systems (Part 2 of 2)

**Session Code:**     **AMAF205**

**Room 202D**

**Session Time:**     **3:30 p.m.**

Metrology and automation control system developments have progressed significantly in recent years. This session will present and discuss the application and potential applications of these systems in aerospace manufacture. It features system developments in metrology for machine control, accuracy enhancement and system performance evaluation to meet the demands of new aircraft programs.

**Organizers -**     *Eric Barnes, Northrop Grumman; Phil Crothers, Boeing Research & Technology; Roger Holden, Metris UK; Jeffrey Morgan, Boeing; Todd Szallay, Northrop Grumman Corp.*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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<b>3:30 p.m.</b>	<b>ORAL ONLY</b>	<b>Laser Tracker Adaptive Control for Machining Applications by use of Standard Industrial Robots</b> Clemens Draschba, Thyssenkrupp System Engineering; Joerg Bunke, ThyssenKrupp System Engineering
<b>4:00 p.m.</b>	<b>ORAL ONLY</b>	<b>Utilization of Optical Metrology Guidance for Precision Robotic Machining of Composites</b> Roger Holden, Paul Lightowler, Nikon Metrology
<b>4:30 p.m.</b>	<b>2012-01-1869</b>	<b>Automated Metrology Solution to Reduce Downtime and De-Skill Tooling Recertification</b> Robert Flynn, Karl Christensen, Electroimpact Inc.; Ray Ryan, East Coast Metrology LLC

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Composites Fabrications and Joining (Part 1 of 3)

**Session Code:**     **AMAF200**

**Room 203A**

**Session Time:**     **10:00 a.m.**

The expanding usage of composite materials in the aerospace industry is driving a surge of interest in the fabrication and assembly of airframe skins, structures and exterior components. This session will focus on several areas of composites including new advances in fabrication and joining. It will also address issues regarding large structural manufacturing, structural health monitoring and thermal/electrical structure concepts and applications.

**Organizers -**     *Jeffrey Morgan, Boeing; Lawrence Wilkie, Northrop Grumman Corp.*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>10:00 a.m.</b>	<b>ORAL ONLY</b>	<b>Affordable Automated Dry Machining of Composite Assemblies for JSF</b> Michael Cowan, Joeseeph D. Breda, Wesley Alleman, Lockheed Martin Aeronautics
<b>11:00 a.m.</b>	<b>ORAL ONLY</b>	<b>Drill Geometries and Their Effects on Today's Modern Composites</b> Jeff Stephens, OSG Tap & Die

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Composite Manufacturing

**Session Code:**     **AMAF202**

**Room 203A**

**Session Time:**     **1:00 p.m.**

The expanding usage of composite materials in the aerospace industry is driving a surge of interest fabrication and assembly of airframe skins, structures and exterior components. This session will focus on areas of composites including new advances in superstructures, large composite structure arrays, and approaches to enhance composite structures.

**Organizers -**     *James H. Campbell, Lockheed Martin Aeronautics Co.; Jeffrey Morgan, Boeing; Jarrod Ridge, Royal Engineered Composites Inc.*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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<b>1:00 p.m.</b>	<b>2012-01-1864</b>	<b>Automatic Handling of Carbon Fiber Preforms for CFRP Parts in Aerospace</b> <i>Hilmar Apmann, Alexander Hemmen, Manuel Herkt, Premium AEROTEC GmbH</i>
<b>1:30 p.m.</b>	<b>2012-01-1863</b>	<b>New Cutting Tools for Repairs of Composites</b> <i>Peter Mueller-Hummel, Mapal Inc.</i>
<b>2:00 p.m.</b>	<b>2012-01-1862</b>	<b>Unique Non-Orthogonal TCP Intersecting AFP Axes Design</b> <i>Guy Faubion, Todd Rudberg, Electroimpact Inc.</i>
<b>2:30 p.m.</b>	<b>ORAL ONLY</b>	<b>From Fibers to Zero Faults with Next-Generation PLM-Composites Solutions</b> <i>Rani Richardson, Dassault Systèmes</i>
<b>3:00 p.m.</b>	<b>ORAL ONLY</b>	<b>Electromagnetic Shielding of Composite Aircraft Structure with Metallic Nanoparticles</b> <i>Mohsen Jalali, Fidele Moupfouma, Bombardier Aerospace; Rolf Wuthrich; Timothée Molière</i>

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## Tuesday, September 18

### Manufacturing/Materials/Structures - Composites Fabrications and Joining (Part 2 of 3)

**Session Code:**     **AMAF200**

**Room 203A**

**Session Time:**     **3:30 p.m.**

The expanding usage of composite materials in the aerospace industry is driving a surge of interest in the fabrication and assembly of airframe skins, structures and exterior components. This session will focus on several areas of composites including new advances in fabrication and joining. It will also address issues regarding large structural manufacturing, structural health monitoring and thermal/electrical structure concepts and applications.

**Organizers -**     *Jeffrey Morgan, Boeing; Lawrence Wilkie, Northrop Grumman Corp.*

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
<b>3:30 p.m.</b>	<b>ORAL ONLY</b>	<b>Automating the Fastener Preparation Process</b> <i>Kelly Brianne Sansom, Lockheed Martin Aeronautics Co.</i>
<b>4:00 p.m.</b>	<b>ORAL ONLY</b>	<b>Automation at Bombardier with ALEMA Automation</b> <i>Etienne Gueydon, Alema Automation</i>
<b>4:30 p.m.</b>	<b>ORAL ONLY</b>	<b>Additional Advanced Functionalities in the Alema Automation Multi Function</b> <i>Claude Cibiel, Alema Automation</i>

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## Wednesday, September 19

### Auto Fastening / Assembly & Tooling (AeroFast) - Optimization of Fastening and Assembly Production Processes

**Session Code:**     **AMAF104**

**Room 202A**

**Session Time:**     **8:00 a.m.**

"This session presents developments in the Automation of Airframe Assembly Processes through use of new and innovative automated equipment for fitting of parts, feeding fasteners and applying sealant."

**Organizers -** Gordon L. Allen, Boeing Co.; Mark W. Smith, Lockheed Martin Aeronautics Co.; Wayne West, Herndon Products

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
8:00 a.m.	2012-01-1870	<b>Automation for Unprecedented Production Rates</b> Brian O'Rourke, Broetje Automation-USA; Randy Rounkles, Spirit AeroSystems
8:30 a.m.	2012-01-1871	<b>Offset Anvil for HH500</b> Carter Boad, Zory Taskar, Electroimpact Inc.
9:00 a.m.	2012-01-1872	<b>Legacy 500 Empennage Assembly - Design for Manufacturing</b> Daniel Carlos da Silva, Gustavo Guimaraes, Antonio Da Rocha Lima, Fabio Silva Zenebon, Andre Barbosadearaujo Carvalho, Embraer-Empresa Brasileira deAeronautica; Gerhard Meffert, Durr Systems GmbH

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### Wednesday, September 19

#### Auto Fastening / Assembly & Tooling (AeroFast) - Assembly Methodologies & Advanced Assembly Fixtures and Tooling

**Session Code:** AMAF100

**Room 202A**

**Session Time:** 10:00 a.m.

This session deals with new and advanced methods of assembly for structures. Topics could include determinant assembly, jigless assembly, automated positioning, moving assembly lines and right sized portable drilling and fastening equipment

**Organizers -** Mark W. Smith, Lockheed Martin Aeronautics Co.; Daniel Thurnau, Spirit AeroSystems Inc.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
10:00 a.m.	ORAL ONLY	<b>Legacy 500: An Innovative Moving Line Approach To Wing Manufacturing</b> John Hartmann, Electroimpact Inc.; Gustavo Guimaraes, Embraer
10:30 a.m.	2012-01-1876	<b>Automated Positioning and Alignment Method and System for Aircraft Structures Using Robots</b> Daniella Yada Negroni, Luis Trabasso, ITA - Tech Institute of Aeronautics; Marcos Leandro Simonetti, Fundacao Casimiro Montenegro Filho
11:00 a.m.	ORAL ONLY	<b>Modular Assembly Cells for Flow Manufacturing</b> Munir Ozdemir, Durr Systems Inc.

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### Wednesday, September 19

#### Auto Fastening / Assembly & Tooling (AeroFast) - Advanced Portable Tools

**Session Code:** AMAF102

**Room 202A**

**Session Time:** 1:00 p.m.



This technical session explores the advancements of robotic and other portable drilling and fastening technologies. Presentations detail the various technologies as well as the methodologies used and challenges faced during their implementation in aerospace manufacturing. Examples of usage of the robotic and other advancements in technologies for portable drilling and fastening in aerospace manufacturing will be shared along with their productivity gains and improvement of product quality

**Organizers -** Archie D. Crowe; Mark W. Smith, Lockheed Martin Aeronautics Co.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2012-01-1879	<b>Portable 2 Axis Milling Machine for CFRP</b> Barry Richards, Electroimpact Inc.; Craig Turnbull, Electroimpact Ltd.
1:30 p.m.	2012-01-1881	<b>Advanced Battery Tools for Ergonomics and Quality Assurance in Aircraft Assembly</b> Niklas Bjorlingsson, Mattias Rengstedt, Atlas Copco Tools & Assembly Systems
2:00 p.m.	2012-01-1880	<b>Electromagnetic Bolt Inserter</b> Peter B. Zieve, Alex Uphoff, Electroimpact Inc.
2:30 p.m.	ORAL ONLY	<b>Depth Accurate Drilling and Countersinking using Advanced Portable Tooling</b> Kevin W. Myhill, Apex Tool Group LLC

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### Wednesday, September 19

## Auto Fastening / Assembly & Tooling (AeroFast) - Design and Management of Fastener Systems

**Session Code:** AMAF103

**Room 202A**

**Session Time:** 3:30 p.m.

New fastening systems pursue the complementary goals of reducing cost, weight, assembly time, field maintenance, and environmental impact. Improved design strength, materials, ergonomics, and feeding/driving systems have enabled many of these goals to be met without sacrificing performance.

**Organizers -** Steven G. Keener, Boeing Co.; Mark W. Smith, Lockheed Martin Aeronautics Co.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
3:30 p.m.	2012-01-1888	<b>FC43®: A New Structural Panel Fastener</b> Rodrigo Pinheiro, Frank Cosenza, Alcoa Fastening Systems
4:00 p.m.	2012-01-1889	<b>Composites Assembly and Fastening Automating Grip Length Measurements to Generate a True As-Built Kit List</b> Roger C. Richardson, Tom Stewart, Delta Sigma Company
4:30 p.m.	ORAL ONLY	<b>End-to-end Fastener Data Integration for Designers, ME and NC Programmers</b> Dan Hasley, CENIT North America Inc.
5:00 p.m.	2012-01-1887	<b>On the Development of Predictive Simulation Methods for Automated Fastening</b> Brett Malone, Rick Guptill, Yash Khandhia, AC&E, Inc.; Paul Lindstadt, Dean Cross, Viet Hoang, Spirit AeroSystems, Inc.

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### Wednesday, September 19

#### Manufacturing/Materials/Structures - Metals, Fabrication and Processing (Part 2 of 2)

**Session Code:** AMAF203

**Room 202B**

**Session Time:** 8:00 a.m.

Advancements in the production of metallic structure continue to be important to the aerospace and commercial aviation industries. This session features improved materials, processes, and joining methods for metallic components to meet the challenges put forth by demanding end product requirements.

**Organizers -** Benny J. Leppert, Jeffrey Morgan, Jeffrey Morgan, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
8:00 a.m.	2012-01-1873	<b>Stretch Roll Forming</b> <i>Palanivel Swaminathan, Mahdi Saket Kashani, Viswanathan Madhavan, Fairmount Technologies LLC</i>
8:30 a.m.	2012-01-1874	<b>Advanced Aluminum and Aluminum-Lithium Solutions for Derivative and Next Generation Aerospace Structures</b> <i>Brandon Bodily, Markus Heinemann, Gary Bray, Edward Colvin, Jeffrey Witters, Alcoa</i>
9:00 a.m.	ORAL ONLY	<b>The Construction of a Propulsion System with Additive Manufacturing</b> <i>Stewart Davis, CRP Technology SRL; Matt Dushku, Experimental Propulsion Lab.</i>

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### Wednesday, September 19

#### Manufacturing/Materials/Structures - Product Design and Manufacturing Integration (Part 1 of 2)

**Session Code:** AMAF210

**Room 202B**

**Session Time:** 1:00 p.m.

Airframe design and certification requires thorough investigation of physical system behavior, identification of all failure modes, and quantification of all safety margins. To meet modern performance criteria, these certification requirements necessitate advanced analysis and modeling tools that efficiently and effectively leverage the knowledge. This session will focus on advanced methods and tools to analyze engineering practices and model production system practices.

**Organizers -** Ramesh Kolar, Naval Postgraduate School; Jeffrey Morgan, Stephen Walls, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
1:00 p.m.	2012-01-1883	<b>Managing the Cost of Quality</b> <i>Don Jasurda, DCS Inc.</i>
1:30 p.m.	2012-01-1882	<b>Design, Modeling, and Evaluation of a Cost Effective Particulate Control System</b> <i>Yucheng Liu, Safa Alidoust, Benny Qi, University of Louisiana at Lafayette</i>
2:00 p.m.	ORAL ONLY	<b>F-35 Center Wing Automated Transport System</b> <i>Peter E. Neumeier, Lockheed Martin Aeronautics Co.</i>
2:30 p.m.	ORAL ONLY	<b>Optically Projected Assembly Guidance for Aerospace</b> <i>Mark W. Bowen, Lockheed Martin Aeronautics</i>

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### Wednesday, September 19

## Manufacturing/Materials/Structures - Product Design and Manufacturing Integration (Part 2 of 2)

**Session Code:** AMAF210

**Room 202B**

**Session Time:** 3:30 p.m.

Airframe design and certification requires thorough investigation of physical system behavior, identification of all failure modes, and quantification of all safety margins. To meet modern performance criteria, these certification requirements necessitate advanced analysis and modeling tools that efficiently and effectively leverage the knowledge. This session will focus on advanced methods and tools to analyze engineering practices and model production system practices.

**Organizers -** Ramesh Kolar, Naval Postgraduate School; Jeffrey Morgan, Stephen Walls, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
3:30 p.m.	ORAL ONLY	<b>Hydrogen Airships Design for Safety</b> Michele Trancossi, Universita' di Modena e Reggio Emilia
4:00 p.m.	2012-01-1892	<b>Quite-Rigid Airship Structure Concept and Design for Enhanced Hovering Capability</b> Mauro Madonia, Michele Trancossi, Agostino Coppola, Università di Modena e Reggio Emilia
4:30 p.m.	ORAL ONLY	<b>Effects of ACHEON Jet Orienting System on the Design of an Unconventional Aerial Vehicle</b>

Michele Trancossi, Universita' di Modena e Reggio Emilia

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### Wednesday, September 19

## Manufacturing/Materials/Structures - RFID Applications in Aerospace

**Session Code:** AMAF204

**Room 202D**

**Session Time:** 8:00 a.m.

RFID, beyond mandates and the retail industry, has become an enabler for quality control, asset management and value stream mapping. End users, including the Department of Defense, aerospace/automotive and retail, are implementing and realizing higher savings and efficiency levels, today, through the increased visibility provided by RFID. This session will present and discuss the RFID impact on manufacturing, supply chains and traceability along with RFID's role in the business case.

**Organizers -** George Nicholas Bullen, Smart Blades Inc.; Jeffrey Morgan, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
8:00 a.m.	ORAL ONLY	<b>Mobile Asset Tracking - Increasing Tool &amp; Equipment Utilization</b> Paul Baboian, Zebra Technologies Corp.
8:30 a.m.	ORAL ONLY	<b>RFID Technology Transfer from Health Care to Aerospace</b> Tim Shinbara, Northrop Grumman Corp.
9:00 a.m.	ORAL ONLY	<b>The Current State of RFID Applications in Aerospace</b> George Nicholas Bullen, Smart Blades Inc.

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### Wednesday, September 19

#### Manufacturing/Materials/Structures - Innovation in IVHM and SHM - "The Critical Success Elements", Expert Panel Discussion

**Session Code:** AMAF206

**Room 202D**

**Session Time:** 10:00 a.m.

Emerging IVHM and SHM technologies are enabling a connected world of intelligent machines and devices for managing the health of planes, trains, automobiles and other industrial products. How do you ensure that these new products and services are desirable, economically viable, and technically feasible? Connect with a panel of experts and innovators to discuss IVHM and SHM related industry trends, emerging technologies and innovations, market opportunities, and business considerations.

**Organizers -** George Nicholas Bullen, Smart Blades Inc.; Peter Foote, BAE Systems; Jerry Huang, Boeing Co.; Ramesh Kolar, Naval Postgraduate School; Jeffrey Morgan, Boeing

**Moderators -** George Bullen, Smart Blades Inc.

**Panelists -** Erik Bullen, Frog Design Inc.; Christopher L. Thompson, GE Energy Products Inc.; Vijay Varadan, Univ. of Arkansas;

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### Wednesday, September 19

#### Auto Fastening / Assembly & Tooling (AeroFast) - New Aircraft Assembly Support Technologies

**Session Code:** AMAF106

**Room 202D**

**Session Time:** 1:00 p.m.

This session will focus on robotics assembly and fastening as well as teleoperative or other innovative devices that assemble, clean, seal and inspect aircraft structure that is difficult of mechanics and technicians to access.

**Organizers -** Clayton L. Munk, Boeing; Mark W. Smith, Lockheed Martin Aeronautics Co.; Philip Webb, Cranfield Univ.

<i>Time</i>	<i>Paper No.</i>	<i>Title</i>
1:00 p.m.	ORAL ONLY	<b>Grip Gun Abstract, 2012</b> Joseph D. Festa, Northrop Grumman Corp.
1:30 p.m.	ORAL ONLY	<b>Measurement Technology for the Quality Control of Large Aircraft Components</b> Taoufik Mbarek, Durr Systems GmbH
2:00 p.m.	2012-01-1885	<b>Automated Work Sequencing in Constrained Areas Using Easily Portable and Optical Projection System</b> Roger C. Richardson, Delta Sigma Corp.

Planned by Aerospace Automated Fastening Committee / Aerospace Manufacturing Activity

### Wednesday, September 19

#### Auto Fastening / Assembly & Tooling (AeroFast) - Challenges in Using New Automation to Improve Existing Drilling and Assembly Systems

**Session Code:** AMAF108

**Room 202D**

**Session Time:** 3:30 p.m.

This session examines existing legacy systems and finds modern automated solutions for current and future production processes. Processes improved by these automation and/or re-design solutions may include aircraft assembly, joining, hole preparation and fastening.

**Organizers -** Clayton L. Munk, Boeing; Mark W. Smith, Lockheed Martin Aeronautics Co.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
3:30 p.m.	ORAL ONLY	<b>Challenges of Implementing Automated Drilling in the C-130 Program</b> David Ginburg, Lockheed Martin
4:00 p.m.	2012-01-1891	<b>Automated Horizontal Tail Plane Assembly Environment</b> Michael Brooksiek, Joerg Bunke, ThyssenKrupp
4:30 p.m.	2012-01-1890	<b>Planning and Implementation of Complete Integrated Assembly Lines for the Aircraft Industry through Project Management</b> Marco Moehle, Broetje-Automation GmbH

Planned by Aerospace Automated Fastening Committee / Aerospace Manufacturing Activity

### Wednesday, September 19

#### Manufacturing/Materials/Structures - Composites Fabrications and Joining (Part 3 of 3)

**Session Code:** AMAF200

**Room 203A**

**Session Time:** 8:00 a.m.

The expanding usage of composite materials in the aerospace industry is driving a surge of interest in the fabrication and assembly of airframe skins, structures and exterior components. This session will focus on several areas of composites including new advances in fabrication and joining. It will also address issues regarding large structural manufacturing, structural health monitoring and thermal/electrical structure concepts and applications.

**Organizers -** Jeffrey Morgan, Boeing; Lawrence Wilkie, Northrop Grumman Corp.

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
8:00 a.m.	ORAL ONLY	<b>Latest Tooling Solutions for Manual, Semi and Fully Automated Applications in CFRP and when Stacked with Titanium and Aluminum</b> Ingo von Puttkamer, Guhring oHG
8:30 a.m.	ORAL ONLY	<b>Latest Developments in Adhesion Promotion of High Performance Materials Using Atmospheric Plasma Technology</b> Rory Wolf, Enercon Industries
9:00 a.m.	2012-01-1875	<b>Cutting Tool Technology for Machining Composite Curing Tools</b> Peter Mueller-Hummel, Mapal Inc.

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### Wednesday, September 19

#### Manufacturing/Materials/Structures - Automated Composites Manufacturing (Part 1 of 2)

**Session Code:** AMAF201

**Room 203A**

**Session Time:** 10:00 a.m.

The expanding usage of composite materials in the aerospace industry is driving a surge of interest in increasing production of airframe skins, structures and exterior components. This session will focus on higher output through automated manufacturing methods technology. It will also address issues regarding large structural manufacturing.

**Organizers -** Vernon M. Benson, ATK Space Systems; Carroll G. Grant, Aerospace Composites Consulting; Jeffrey Morgan, Boeing

<b>Time</b>	<b>Paper No.</b>	<b>Title</b>
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10:00 a.m.	ORAL ONLY	<b>Laser Heating Out-of-Autoclave Materials for Fiber Placement</b> Manu Motilva, Mtorres Group
10:30 a.m.	ORAL ONLY	<b>Improving Part Performance by Use of Fiber Placement Technology</b> Michael Muser, Ingersoll Machine Tools Inc.
11:00 a.m.	2012-01-1886	<b>Incorporation of Laser Projectors in Machine Cell Controller Reduces Ply Boundary Inspection Time, On-Part Course Identification and Part Probing</b> Todd Rudberg, Joshua Cemenska, Electroimpact Inc.

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### Wednesday, September 19

#### Manufacturing/Materials/Structures - Automated Composites Manufacturing (Part 2 of 2)

**Session Code:** AMAF201

**Room 203A**

**Session Time:** 1:00 p.m.

The expanding usage of composite materials in the aerospace industry is driving a surge of interest in increasing production of airframe skins, structures and exterior components. This session will focus on higher output through automated manufacturing methods technology. It will also address issues regarding large structural manufacturing.

**Organizers -** Vernon M. Benson, ATK Space Systems; Carroll G. Grant, Aerospace Composites Consulting; Jeffrey Morgan, Boeing

Time	Paper No.	Title
1:00 p.m.	ORAL ONLY	<b>Designing for Productivity: Aligning AFP Machine Needs and Slit-Tape Package Design</b> Daniel Ott, Web Industries Inc.
1:30 p.m.	ORAL ONLY	<b>Automated Fiber Placement Systems Based on Commercially Available Robots</b> Michael J. Pasanen, Automated Dynamics
2:00 p.m.	ORAL ONLY	<b>In-Process Laser Heating for Automated Fiber Placement</b> Michael Cowan, Lockheed Martin Aeronautics Co.
2:30 p.m.	ORAL ONLY	<b>A Practical Discussion of the Abilities and Limitations of Automated Fiber Placement</b> Bill Hasenjaeger, CGTech.

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### Wednesday, September 19

#### Manufacturing/Materials/Structures - Future Challenges and Opportunities in Composites Simulation and Software

**Session Code:** AMAF208

**Room 203A**

**Session Time:** 3:30 p.m.

Product Lifecycle Management (PLM) is becoming a critical success factor to cover the entire process chain in conjunction with software design tools that address the engineering needs of complex Composites structures for aerospace application. In this session, experts will address issues of simulation for composites and how to overcome the technical difficulties of sequential and trial-and-error-based composites design process.

**Organizers -** Charles Y. Hu, Jeffrey Morgan, Boeing

Time	Paper No.	Title
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<b>3:30 p.m.</b>	<b>ORAL ONLY</b>	<b><i>Realistic Simulation of Thick Composite Bolted Joints: A Novel NASTRAN Method</i></b> <i>David Weinberg, NEi Software</i>
<b>4:00 p.m.</b>	<b>2012-01-1856</b>	<b><i>TruPLAN Advanced Simulation for Material Kinematics Behavior during Manufacturing Layup Processes</i></b> <i>Massimiliano Moruzzi, Dylan MacLean, Magestic Systems Incorporated; Rob Blackburn, Cytec Engineered Materials</i>
<b>4:30 p.m.</b>	<b>ORAL ONLY</b>	<b><i>Using Modern Optimization Technologies to Design Weight Efficient Composite Structures</i></b> <i>Jeffrey A. Wollschlager, Dr. Robert N. Yancey, Altair Engineering</i>
<b>5:00 p.m.</b>	<b>ORAL ONLY</b>	<b><i>Avoiding Drilling and Fastening Mistakes by Simulating NC Program Code</i></b> <i>Bill Hasenjaeger, CGTech</i>
<b>5:30 p.m.</b>	<b>ORAL ONLY</b>	<b><i>Simulation in a Composite Design Process: From Concepts to Optimized and Reliable Designs</i></b> <i>Matthias Alberts, CADFEM US Inc.</i>

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