Now In It’s 5th Year...

A GALM SERIES EVENT

Lightweight Materials And EV Body Structures
MANUFACTURING TECHNOLOGIES 2018

February 21-22, 2018 | Motor City Casino Hotel, Detroit, MI

Strategies And Techniques For Multi-Material Joining, Forming And Corrosion Mitigation
For Conventional And Electric Vehicle Body Structures
Case Study Based Solutions On Composites To Metals, Aluminums To Steels, And Magnesium


New Topics and New Faces for 2018

Corrosion Mitigation Strategies: Showcasing The Latest Industry Best Practice And Technologies For Corrosion Mitigation In Mixed Material Structures

Michael W Danyo Technical Specialist - Aluminum Structures

EV/Hybrid Vehicle Design: Future vehicle requirements; joining and manufacturing processes will be adapted for EV/Hybrid Vehicles.

Elie M. Tohme Director of Body Engineering

Battery Pack Mounting: Mounting And Integrating Battery Packs Into Lightweight Body Structures

Dr. Salman Kahn Senior CAE Lead

Laser Welding: Laser Welding Between Steel And Ductile Iron Dissimilar Materials

Dr. Huaxin Li Material/Welding Technical Specialist

Highlights Include:

- Corrosion Mitigation Strategies: The Latest Industry Best Practice And Technologies For Corrosion Mitigation In Mixed Material Structures.
- EV/Hybrid Vehicle Design: Future Vehicle Requirements; Understand How Joining And Manufacturing Processes Will Be Adapted For EV/Hybrid Vehicles.
- Battery Pack Mounting: Mounting And Integrating Battery Packs Into Lightweight Body Structures
- Laser Welding: Laser Welding Between Steel And Ductile Iron Dissimilar Materials
- Welding Solutions For UHSS To Aluminum: Solutions To Resistance Spot Welding Of AHSS & Novel Process For Welding Aluminum To Steel
- Magnesium Focus: Detailed Analysis And Evaluation Of Magnesium Component Manufacturing + Viability For Large Scale Roll Out
- UHSS Springback Prediction: Detailed Analysis Of How To Increase Prediction Performance Of UHSS Component Following Springback
- Aerospace Innovation: Adhesive Joining With Mechanical Fasteners And Extreme Temperature Testing

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This year’s OEM-led agenda will focus on providing solutions to the most current joining and forming issues for large-scale vehicle manufacturing with the added bonus of exploring how EV body structure will impact current and future joining and manufacturing technologies.

Currently, the Environmental Protection Agency (EPA) has set the requirement of fuel economy that would gradually increase the average miles per gallon requirements for cars to 54.5mpg by 2025.

As lightweighting technologies continue to impact the manufacturing of vehicle production, the resulting benefits of driving fuel efficiency, lowering carbon footprint and enhancing vehicle performance remains at the forefront. Thus, discovering the latest methodologies and technologies in joining dissimilar materials, and reducing production cycles for high-volume vehicle production continues to be the priority for the automotive industry.

The 2018 event will gather together knowledge and information from both leading traditional and new electric vehicle OEMs to showcase the latest case studies and discussions aimed at enhancing the performance of dissimilar material joining, corrosion mitigation strategies and eliminating thermal expansion issues, whilst at the same time improving manufacturing processes for lightweight materials: Magnesium, Aluminum, New-Age Steel and Composites.

The event theme is carefully contextualised to bring a 360-degree view on driving down costs and improving the scalability of new manufacturing technologies.

Alistair Ren-Healey  
Content Director  
Lightweight Manufacturing Summit USA & Europe

Ashley Barnes  
Group Commercial Director  
Lightweight Manufacturing Series Global

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The Lightweight Materials And EV Body Structures Manufacturing Technologies 2018 offers an exclusive opportunity for your company to showcase your brand and services in a specialist environment.

Your presence at this event will ensure your organization is a recognised solutions provider for the attending OEMs. There are a number of exclusive opportunities available to leverage your company’s expertise. Please contact the ABC team at sponsorship@american-business-conferences.com or call us on (1) 800 721 3915

Exhibiting Companies Include:

- Joining & Forming Robotics
- E Coating Robotics
- Adhesives Joining Robotics
- Forming, Stamping & Casting
- Surface Treatment
- Welding Robotics
- Automation Technology For Joining & Forming Process
- Automation For Assembly Line Technologies
- Adhesive Technology
- Laser Welding
- Resistance Spot Welding
- Joining Simulation
- Crash Worthiness Simulation
- Corrosion Technology
- Advanced Aluminum & Steel Joining Technologies
- Advanced Composite Joining Technologies

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TIER1 partners must attend this event to understand what their customers are striving for as well as gain valuable network connections.

Technical Lead - Materials for Advanced Technology & Research (AT&R), Volvo Group Trucks Technology

A great setting to meet key players in lightweight enabling technologies.

Principal Engineer, Toyota

Good mix of talks and speakers and there was more technical content than I expected. This was a pleasant surprise. Food, resources and media were excellent.

Technical Fellow, General Motors

Concept directly in line with challenges I face everyday. Great to hear other OEMs/Tiers speaking about these issues.

Advanced Materials Research, Honda
ASSESSING THE FUTURE OF JOINING AND MANUFACTURING TECHNOLOGIES FOR EV/HYBRID VEHICLES & MULTI-MATERIAL JOINING STRATEGIES FOR: ALUMINUM, NEXT-GENERATION STEEL AND COMPOSITES

08:50 Chair Opening Remarks
DAY 1 Chair: Jim Erhardt, President, Rifast Systems LLC

OPENING KEYNOTE PANEL SESSION
09:00 Assessing The Structural Requirements Of Electric Vehicle BIW’s And The Impact On Joining, Forming And Manufacturing Technologies Of The Future
Panelist: Antonio Mercado, BIW Process Engineering Manager, Faraday Future
Panelist: Elie Tohme, Director of Body Engineering, Karma Automotive

09:40 Question & Answer Session

09:50 RESERVED FOR DEPRAG

10:20 Question & Answer Session

10:30 Refreshments & Networking Session
SPONSORED BY DEPRAG

CASE STUDY: JOINING DISSIMILAR MATERIALS FOR EV BATTERY INTEGRATION IN NEW MODEL VEHICLE STRUCTURE
11:00 Mounting And Integrating Battery Pack Into Lightweight Body Structures
- Evaluation of different joining techniques and manufacturing technologies for mounting and integrating battery pack casing
- Structural design features and enhanced joint performance to safeguard battery pack integration
Dr. Salman Khan, Senior CAE Lead, Faraday Future
11:30 Question & Answer Session

TEST RESULTS AND CASE STUDIES ON THE PERFORMANCE OF MULTI-MATERIAL JOINING TECHNOLOGIES AND APPLICATIONS
11:40 Question & Answer Session
11:50 RESERVED FOR SEMBLEX
12:20 Question & Answer Session
12:30 Networking Lunch Session - SPONSORED BY SEMBLEX

INNOVATION: METHODOLOGY FOR ALUMINUM TO STEEL STRUCTURES
13:30 Solutions To Resistance Spot Welding Of AHSS & Novel Process For Welding Aluminum To Steel
- Resistance spot weld micro-structure and properties characterization of some AHSS
- Resistance spot welding of Hot-stamped boron steel with Zn and Al-Si coatings
- Resistance spot welding of complex steel stack-ups
- Development of new method for welding aluminum to steel
Menachem Kimchi, Advanced Materials Joining, Ohio State University

14:00 Question & Answer Session
LASER WELDING FOR DISSIMILAR MATERIAL JOINING
14:10 Laser Welding Between Steel And Ductile Iron Dissimilar Materials
- Laser Welding SAE D5506 ductile iron to SAE 5120M steel for front wheel drive differential carrier.
- 360 degree circular weld and effect of weld overlap quality on welding defects.
- Effect of weld geometries and welding parameters on weld cracking.
- Weld quality requirement.
Huaxin Li, Technical Specialist - Ferrous Mat & Welding, General Motors
14:40 Question & Answer Session
14:50 Clinch Nut Applications For Advanced High Strength Steels (Rm > 800 Mpa)
- Development of Class 10 fasteners for installation in AHSS (800 MPA and beyond)
Clinched joint characteristics:
- Class 10 joint for assembly
- Minimal deformation of stamping material
- ZERO cracking on the fastener features during clinching process
Viral Varshney, Director of Engineering, Rifast LLC
15:20 Question & Answer Session
15:30 Refreshments & Networking Session
SPONSORED BY RIFAST SYSTEMS LLC
15:40 Question & Answer Session
15:50 CASE STUDY: RESISTANCE SPOT WELDING
- Resistance Spot Welding and Structural Adhesive Applications in a Low Throughput/Medium Level of Automation Body Line
- Resistance spot welding (RSW) process control and verification practices used in the Optra
- Structural adhesive application process control, and how to improve & decrease valuation for the application of adhesive
- Understand the best practices of adhesive applications in the Optra
Mohamad Elkafafay, Operational Excellence Specialist, General Motors
16:20 Question & Answer Session
MULTI-MATERIAL JOINING PROCESSES
16:30 Joining of Similar and Dissimilar Engineered Materials
- TOX joining of aluminum
- TOX joining of high strength steels
- Other joining processes supported by TOX
Troy Waldherr, North American Sales Manager, Tox Pressotechnik
17:00 Question & Answer Session

CASE STUDY: BIW ADHESIVE BONDING FOR BODY ENGINEERING
17:10 Successfully Joining Composites To Aluminum Using Structural Adhesive: To Achieve Flexibility And Thicker Bond Line
- The performance and durability of structural adhesive bonded joints
- Evaluate the performance of adhesive bonding joints after it goes through hot and cold cycle
- How to match / compensate for differences in coefficient of thermal expansion between metal and composite parts
- Improve the performance of structural adhesive joints in a high impact scenario
- Improve prediction simulation of adhesive joints to understand crashworthiness and safety
Fardi Haddadi, Process Engineering Specialist, Faraday Future

17:40 Question & Answer Session
SUPPLIER CASE STUDY: ROBOT ADHESIVE DISPENSING SYSTEMS
18:10 Discover Advances In Robot Dispensing In The Assembly Line To Enhance Adhesive Performance
- Determine the latest advances in assembly line robots
- Discover what quality check systems are in place following the robot application of adhesive bonds to ensure correct volume is applied
18:40 Question & Answer Session
ADHESIVE INNOVATION
17:20 “Multi-Substrate Adhesives for Automotive Production - US Market.”
Gino Mariani, Marketing - Automotive & Metals Industries, Henkel Adhesive Technologies
17:50 Question & Answer Session
SUPPLIER CASE STUDY: ROBOT ADHESIVE DISPENSING SYSTEMS
18:00 Evaluate Adhesive Bonding Application In Aerospace To Achieve Reliability And Quality Control
- Understand best practice of adhesive application in the aerospace industry
- How to control, improve & decrease valuation for the application of adhesive bonding
- Recognize how to validate adhesive bonding joints for performance, durability and longevity
- Discover transferable technologies and processes for the automotive industry, relating to corrosion mitigation and thermal expansion of composite structure
18:30 Question & Answer Session
18:40 Day One Conclusion Remarks From Jim Erhardt, President, Rifast Systems LLC

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TECHNOLOGIES AND METHODOLOGIES TO MITIGATE GALVANIC CORROSION; THERMAL EXPANSION CHALLENGES AND OPTIMIZING MANUFACTURING FOR LIGHTWEIGHT COMPONENTS

**CASE STUDY: MAGNESIUM TREATMENT**

**11:40 Methodology For Magnesium Pre-Production Treatment**
- Evaluate how magnesium is currently treated in production
- Learn how to safely machine magnesium minimize potential fire hazards
- Understand whether traditional machining cells are able to handle magnesium in a safe & productive way

**12:10 Question & Answer Session**

**Focus B: UHSS Stamping And Spring Back Prediction**

**CASE STUDY: HOT STAMPING FOR UHSS HIGH VOLUME VEHICLE PRODUCTION**

**12:20 Improve Methodology For UHSS High Volume Hot Stamping Production**
- How to streamline hot stamping process to reduce overall cycle time
- What type of high strength steel is more suited for stamping to achieve better elongation
- How to process a reduction in gradient on hot forming high strength steel to achieve less than 0.7 gradient

**12:50 Question & Answer Session**

**CASE STUDY: UHSS MILD STAMPING AND MITIGATION OF SPRINGBACK**

**14:00 How To Achieve Dimensional Quality Without The Challenge Of Springback**
- What technologies are currently available improve prediction of final UHSS component geometry?
- What tools are required to compensate springback effect?
- What are the current methods or strategies in mitigating springback in forming high strength steel?

**RESERVED FOR GM**

**14:30 Question & Answer Session**

**CASE STUDY: HOT STAMPING PROCESS PARAMETER**

**14:40 Influence of Hot Stamping Process Parameters on Downstream Manufacturing Processes**
- Understanding which available parameters for optimizing hot stamping quality of Ultra High Strength Steel components
- Discover the complexity of challenges for production and how up and down stream heating processing can affect stamping, joining and corrosion protection
- How the heating process parameters affect the coating development and subsequent resistance spot weldability of homogenous stackups
- Empirical and analytical model results on Al-Si coated Boron steels

**Raj Sohmshetty, Group Leader – Advanced Steel Technology Manufacturing Research Department, Ford Motors**

**15:10 Question & Answer Session**

**Focus C: Composite Forming**

**CASE STUDY: COMPOSITE HOT PRESSING**

**15:50 Lessons In Thermoplastics Sheet Forming (Body Panels & Components)**
- Recognize how to achieve high performance components in thermoforming
- Understand how to adapt composite forming for high volume production
- Discover whether currently composite forming can achieve efficiency in cost and manufacturing processes

**16:20 Question & Answer Session**

**Focus D: Reducing Carbon Footprint – Future Technology**

**CASE STUDY: 3D MANUFACTURING**

**16:30 Assess The Current Trends In 3D Metal Laser Sintering**
- Understand how 3D metal laser sintering can improve current manufacturing scenario for lightweight material components
- Review challenges and requirements of 3D MLS for large scale volume manufacturing

Dr Paul J Wolcott, Applications Engineer – Additive Manufacturing, General Motors

**Session Highlights: <Aluminum>, <Steel>, <Additive Manufacturing>**

**17:00 Question & Answer Session**

**Focus E: Aluminum Stamping**

**CASE STUDY: ALUMINUM STAMPING**

**17:10 Discover How To Improve Aluminum Stamping Process For A Better Quality Of Finished Product**
- Analyzing the current manufacturing trends and processes for aluminum 5xxx, 6xxx and 7xxx series
- Understand how to maintain a quality finish for aluminum and avoiding burr material getting into the die

**17:40 Question & Answer Session**

**ALUMINUM JOINING APPLICATION**

**17:50 Joining Of Aluminum Extrusions In Automotive Applications**
- Structural joining methods in BW components
- E-mobility: challenges for joining techniques
- Battery boxes, el. motor casings, enclosures, electric cables
- Joining dissimilar materials:
  - Desired combinations
  - Current and Prospective technologies

David A Lukasik, Director Innovation & Technology, Hydro Extruded Solutions North America

**18:10 Question & Answer Session**

**18:20 HYDRO EXTRUDED SOLUTIONS NORTH AMERICA**

VIP Concluding Remarks + Apple TV Draw

**18:30 – 19:30 Networking Drinks Reception Area SPONSORED BY HYDRO EXTRUDED SOLUTIONS NORTH AMERICA**

End Of Summit
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