Evaluating The Most Cost Effective Approaches To Configure New, Lighter, Mixed Material Solutions For Next Generation Vehicle Platforms, Architectures & Structures Including …

Joining Technologies For Mixed Metals & Materials Including Structural Adhesives, Welding & Fastening Solutions
Applications For Advanced Lightweight Materials & Evaluating The Latest High Strength Steels, Aluminum Alloys, Carbon Fiber & Plastic Composites

Improving Simulation Of The Latest Advanced Materials, Joining Techniques And Manufacturing Processes For EVs – Including Modelling Structural Adhesives Performance

NEW! – HIGHLIGHTS OF 2019 AGENDA

Featuring In-Depth Case Studies On The Latest Innovations:

- Material Selection For EV & Autonomous Vehicle Architectures And Structures
- Optimizing Multi-Material Combinations For EV & Autonomous Vehicle Lightweighting
- Evaluating Materials For Safety & Enhanced Crashworthiness Performance
- Automated Testing Best Practices For Evaluating Joint Quality
- Designing Carbon Fiber And Plastic Composites Effectively Into Body Structures
- Adopting The Latest Dissimilar Material Joining Combinations With Fasteners, Welding And Adhesives
- Implementing Manufacturing 4.0 For Integrated Design And Manufacturing
- Manufacturing Process Innovation Through Additive With Metals At Larger Scale
- Implementing Manufacturing 4.0 For Integrated Design And Manufacturing
- Manufacturing Process Innovation Through Additive With Metals At Larger Scale
- Evaluating Joining Technologies For Mixed Metals & Materials Including Structural Adhesives, Welding & Fastening Solutions

2019 EXPERT SPEAKERS INCLUDE:

Dr. Zhong Chen
Senior Engineer, Advanced Metallic Lightweight Materials
NIO

Dr. Venkat Aitharaju
Senior Researcher, Polymer Composites, R&D Technical Center
General Motors

James Truskin
Technical Fellow, Body Advanced Architecture
Fiat Chrysler Automobiles

Prof. Dr. Ing. Achille Mbang Sama
Leader, European Affordable Lightweight Automobiles ALLIANCE Project
Mercedes-Benz (Daimler)

Leon Kaunitz
Director of Body, Structural Engineering and Advanced Technology
NIO

Elie Tohme
Director, Body Engineering
Karma Automotive

Bruce Gordon
Head of Engineering
Electra Meccanica Vehicles Corp.
2019 Speakers

Benefit From Expert Insights, In-Depth Presentations, Interactive Panels, First Hand Experiences And Case Studies From Leading OEMs, Top Tier Suppliers And Technology Innovators Including:

Dr. Zhong Chen
Senior Engineer, Advanced Metallic Lightweight Materials
NIO

Dr. Venkat Aitharaju
Senior Researcher, Polymer Composites, R&D Technical Center
General Motors

Prof. Dr. Ing. Achille Mbang Sama
Leader, European Affordable Lightweight Automobiles ALLIANCE Project
Mercedes-Benz (Daimler AG)

Dr. Fei Xiong
Vice President, Product Engineering, Electric Vehicles
Qiantu Motor

Dr. Venkat Aitharaju
Senior Researcher, Polymer Composites, R&D Technical Center
General Motors

Dr. Venkat Aitharaju
Senior Researcher, Polymer Composites, R&D Technical Center
General Motors

Jordan Kiesser
Materials Engineering - Team Leader, Plastics, Composites, Bonding
PACCAR

James Truskin
Technical Fellow, Body Advanced Architecture
Fiat Chrysler Automobiles (FCA)

Martin McDonnell
Experimental Mechanical Engineer
CCDC Ground Vehicle Systems Center (GVSC)

Hank Bonutti
Advanced Technology Manager
Mahindra NATC

Muhammad Majeed
Manufacturing Engineering Lead
Rivian

Samuel Isana
President, North American Operations
Neuman Aluminium Impact Extrusion

Dana McCarius
Advanced Vehicle Engineering, Energy Efficiency & Competitive Intelligence
ESG Automotive

John Catterall
Executive Director
Auto/Steel Partnership (A/SP)

Gregg Peterson
Technical Advisor
Prefix Corp.

Dr. Leslie Wolschleger
Vice President, Research & Development
Sika

Dr. Edgar Vidal
Global Director of Business Development and Marketing
NobelClad

Dr. Roger Wise
Founder and Director
Ultrawise Innovation

Troy Waldherr
North American Sales Manager
TOX Pressotechnik

Dr. Chaman Lall
Vice President, Technology & Applications Development
Metal Powder Products (MPP)

Nick Scott
Applications Engineer
Luna Innovations
THE ROLE FOR LIGHTWEIGHTING IN THE MOVE TO ELECTRIFICATION

Returning for the 8th year to the Cobo Center in Detroit, the Global Automotive Lightweight Materials Summit will be taking place on 20-21-22 August 2019.

Due to demand from previous audiences of OEMs and tier suppliers, this year's program will cover a range of new developments affecting the industry - in particular strategies for lightweighting body structures for electric and autonomous vehicles to reduce mass, drive down costs and enable more intelligent designs.

While lightweighting is nothing new, the whole process for EVs and autonomous vehicles creates a fresh set of challenges for the automotive industry. New approaches need to be established for integrating the battery into the vehicle structure as well as considering a whole additional range of materials and material combinations. Meanwhile the costs, size and mass of EV batteries are continually being redeveloped and improved in terms of energy density and performance. Key areas to be explored include:

- What is the value of lightweighting for an EV? What is the impact on the battery performance curve and what material changes will this drive as a result?
- What materials and engineering approaches should be adopted for the battery tray and cover?
- How can the latest high strength lightweight metals and composites be employed to meet safety prerequisites for battery intrusion protection?
- What are the opportunities for carbon fiber composites and additive manufacturing? And what about the specific
- Component manufacturing challenges in terms of high volume, reduced cycle times and lower costs?

WHAT DELEGATES HAVE SAID ABOUT THE GALM SUMMIT GLOBAL SERIES...

“Great organization, presenters well prepared, exhibits are a good complimentary elements on the congress”
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 R&D Americas

“Overall a very knowledge filled and well produced conference. Presenters were well selected and well prepared”
Engineering Group Manager, General Motors

“I liked the speakers and the agenda”
Senior Manager Body Structures, Jaguar Land Rover

“Great opportunity for OEMs, Tiers and others to meet learn and network in a professional environment”.
Toyota

“Good conference, well organized, interesting topics”
Principal Engineer: Body Structures, Aston Martin

“I liked the speakers and the agenda”
Senior Manager Body Structures, Jaguar Land Rover

NEW FOR 2019:

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**OPENING KEYNOTE PANEL: EV LIGHTWEIGHTING**

**08:40** Evaluating The Latest Data On How Lightweighting Objectives May Change For Battery Electric And Autonomous Vehicles - How Important Is Mass Reduction Going To Be In The Future?
- Value of lightweighting for fuel efficient ICEVs, EVs and autonomous vehicles
- Material selection for EVs - How important is mass reduction going to be? - Will it become less critical?
- What will be the impact on mass reduction?
- Impact of vehicle architecture including battery size and interior design on material choices
- Implications of shifting battery performance curves with increased energy density
- Case examples for SUVs, city cars and lightweight pickup trucks

**08:50** Case Study: Joining Gen3 To Aluminium
Dr. Edgar Vidal, Global Director of Business Development and Marketing, NobelClad

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<tr>
<td>10:20</td>
<td>Question And Answer Session</td>
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<tr>
<td>10:30</td>
<td>Refreshments And Networking Break In Exhibition Area</td>
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<td>Joining Technologies For Mixed Metal Solutions Including Mechanical Fastenings, Welding And Adhesives</td>
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**CASE STUDY: JOINING HSS**

**11:00** Weldability Of High Manganese, High Aluminium (FeMnAl) Steel Resulting In A Less Dense Solution
Martin McDonnell, Experimental Mechanical Engineer, CCDC Ground Vehicle Systems Center (GVSC)

**CASE STUDY: JOINING GEN3 TO ALUMINIUM**

**11:40** Innovations For Dissimilar Metal Welding
Dr. Edgar Vidal, Global Director of Business Development and Marketing, NobelClad

**STRUCTURAL ADHESIVE BONDING**

**12:20** Leading The Way - Adhesives That Enable Industry Trends
Dr. Leslie Wolschleger, Vice President, Research & Development, Sika

**13:00** Networking Lunch

**14:10** Evaluating The Trade Offs Using Adhesives For Different Types Of Joints And Their Applications
- How do we lightweight the whole joining process?
- What are trends in reducing complexity with flange design, mechanical fastenings, welding and adhesives?
- Understanding adhesive flow processes under welding
- Role of adhesives in corrosion protection, stiffness and managing noise vibration and harshness (NVH)

**14:40** Question And Answer Session

**14:50** Advances In Test, Measurement And Validation - Role For High-Definition Fiber Optic Sensing
Nick Scott, Applications Engineer, Luna Innovations

**15:20** Question And Answer Session

**15:30** Refreshments And Networking Break In Exhibition Area

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08:00 Registration & Morning Refreshments

08:30 Chair’s Opening Remarks

Examining Opportunities For New Multi-Material Solutions For Future Electric And Autonomous Vehicle Architectures

KEYNOTE: LIGHTWEIGHTING FOR AFFORDABLE AND EFFICIENT VEHICLES

08:40 Progress Towards New Lightweight Materials For The Next Generation Of Cars: Update On Europe’s Affordable Lightweight Automobiles ALLIANCE Project
- Adopting a holistic approach to affordable and effective lightweighting
- Development of novel advanced materials
- Mass optimizer software tools and multi-parameter design methodology
- Innovative manufacturing technologies
- Plans for real vehicle demonstrators including implementation of optimized modules
- Towards an open inclusive framework and central hub for lightweight design in Europe

Prof. Dr. Ing. Achille Mbang Sama, Leader, European Affordable Lightweight Automobiles ALLIANCE Project, Mercedes-Benz Operations (Daimler AG)

09:15 Question And Answer Session

Panel And Case Studies On Vehicle And Component Lightweighting

09:25 Production And Validation Challenges For Lightweight Vehicle Body And Component Construction at PACCAR
- Overview of PACCAR’s vehicle construction and materials used
- Dealing with the challenges of aluminum body-in-white construction
- Achieving durable class-A surfaces
- Bonding bare and pre-treated aluminum
- Manufacturing process compatibility with applied materials such as adhesives, sealants, sound deadeners and panel stiffeners
- Validation of applied materials with respect to manufacturing complexities involving processing tubes, handling, storage and post bonding processes
- Overcoming manufacturing challenges with use of large plastic and composite components
- Validation of mixed material assemblies and thermoplastic composites in high stress applications
- Verification of bonding processes by parts teardown
- Environmental conditioning considerations for validation of long term durability

Jordan Kiesser, Materials Engineering - Team Leader, Plastics, Composites, Bonding, PACCAR

10:00 Question And Answer Session

BODY, CHASSIS & POWERTRAIN

10:10 Lightweighting In The Automotive Industry Through Use Of Low Density Powder Metallurgy Alloys
- Attributes of powder metallurgy (PM) aluminum Ti, Mg, Al alloys offering the potential to reduce the mass of components by about 50%

10:25 Question And Answer Session

Panel And Case Studies On Vehicle And Component Lightweighting

10:30 Networking Lunch

STAMPING

14:00 Hot Stamping Of Gen3 Steels For More Complex Parts
- Formability and hot stamping advances
- Minimizing cost of task time with hot stamp processes

14:25 Question And Answer Session

LME AND POROSITY

14:30 Managing Liquid Metal Embrittlement (LME) In Joining Gen3 Steels - Looking For Optimal Solutions
- Overcoming spot welding challenges with zinc hot-dip galvanized steels which can give rise to LME

14:45 Chair’s Closing Remarks - Day 2

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**DAY 3**
Thursday, AUGUST 22, 2019

**MANUFACTURING 4.0**

**08:00** Registration & Morning Refreshments

**08:30** Chair’s Opening Remarks

**Understanding Digitalization Opportunities And Industry 4.0 For Integrated Design And Manufacturing**

**08:40** Understanding And Realizing The Potential Of Digitization And Industry 4.0 For EV And Autonomous Vehicle Manufacturing
- Functional requirements from an architecture perspective for EV manufacturing
- Principles and approaches with Industrial Internet of Things (IIoT)
- Automation as the key to improved throughput
- Optimizing the production system

**09:00** Question And Answer Session

**DIGITAL TWIN**

**09:20** Evaluating Digital Twin For Integrated Design And Manufacturing
- Opportunities for real time process optimization
- Modelling real time production processes
- Case studies on automotive design and production

**09:50** Question And Answer Session

**10:00** High Strength 7XXX Series Aluminum Alloys For Automotive Applications
**Dr. Zhong Chen, Senior Engineer, Advanced Metallic Lightweight Materials, NIO**

**10:30** Question And Answer Session

**10:40** WHAT Is The Right Solution For Your Needs And WHY Impact Extrusion Should Be Considered
- Understanding the impact extrusion process
- Case studies: When impact extrusion is a benefit
**Samuel Insana, President, North American Operations, Neuman Aluminium Impact Extrusion**

**11:05** Question And Answer Session

**11:15** Refreshments And Networking Break In Exhibition Area - Sponsored by Neuman Aluminium Impact Extrusion

**PANEL: HIGH STRENGTH ALUMINUM ALLOYS**

**11:45** Manufacturing Process Innovations For Aluminum Forming, Joining, Castings And Extrusions For Lightweight Structures
- Latest developments in 6000 and 7000 series aluminum alloys for automotive applications
**Hosted by Aluminum Association / DriveAluminum**
**Dr. Zhong Chen, Senior Engineer, Advanced Metallic Lightweight Materials, NIO**

**12:30** Networking Lunch

**Evolving Lighter Structures And Applications At Lower Cost With High Strength Aluminum And Composites**

**STRUCTURAL MONITORING**

**13:30** Innovations In Embedded Sensor Monitoring Of The Health Of Vehicle Structures
- Monitoring EV structural health and battery lifetime with smart materials
- Potential for improving safety and driveability
**Dr. Venkat Aitharaju, Staff Researcher, Polymer Composites, R&D Technical Center, General Motors**

**14:00** Question And Answer Session

**PANEL: CARBON FIBER AND PLASTIC COMPOSITES**

**14:10** Optimizing The Design Of Lightweight Body Structures With Carbon Fiber Composites And Plastic Composites
- Optimized lightweight design for composite applications
- High performance and complex structures
- Developments in manufacturing processes to make best use of composite material capabilities
- Achieving high quality composite components with increased throughput and lower cost
**Dr. Fei Xiong, Vice President, Product Engineering, Electric Vehicles, Qiantu Motor**
**Hank Bonutti, Advanced Technology Manager, Mahindra NATC**
**Dr. Venkat Aitharaju, Staff Researcher, Polymer Composites, R&D Technical Center, General Motors**

**14:50** Question And Answer Session

**15:00** Refreshments And Networking Break In Exhibition Area

**PANEL: ADDITIVE MANUFACTURING EVALUATION**

**15:30** Implementing Additive Metal Manufacturing At Larger Scale
- Scaling up additive and 3D manufacturing for metals
- Case studies on potentially transformative applications

**15:55** Question And Answer Session

**PANEL: ADDITIVE MANUFACTURING**

**16:05** Adopting The Latest Additive Technologies For Manufacturing Process Improvement
- Additive’s benefits in the manufacturing of lightweight production level parts
- Comparison on a strength-to-cost and strength-to-weight ratio basis
- Applications in rapid prototyping

**16:40** Question And Answer Session

**CLOSING PANEL: ADVANCED AUTOMOTIVE MATERIALS**

**16:50** Understanding The Commercial Availability And Adoption Of Advanced Tailored Materials For Breakthrough Performance In Lightweighting And Special Purpose Applications
- Expectations on availability of advanced customized lightweighting materials for EVs and autonomous vehicles
- Evolution of the cost curves for advanced and hybrid materials
- Latest progress in materials cocktails and customization
- Future of Integrated Computational Materials Engineering (ICME)
**Prof. Dr. Ing. Achille Mbang Sama, Leader, European Affordable Lightweight Automobiles ALLIANCE Project, Mercedes-Benz Operations (Daimler AG)**

**17:25** Chair’s Closing Remarks - Day 3 Followed By Apple TV And Champagne Draws

**17:30** End Of Conference
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August 20-22, 2019
Detroit, Michigan

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