Automotive Energy Storage Systems

Final Program
March 7 and 8, 2018
Sheraton Detroit Novi Hotel - Novi, Michigan U.S.A.

Sponsors

www.itbgroup.com
7:30 a.m. Registration and Continental Breakfast

8:45 a.m. Welcome and Introductory Remarks
Dr. Joel Kopinsky, Managing Director
The ITB Group (U.S.A.)

9:00 a.m. An Industry in Transition - A Live Survey

9:10 a.m. Optimized Multilayer Solutions for Fuel Lines
Engineer
UBE Industries (Japan)
New fuel line challenges have emerged due to changing fuels, regulations and technical requirements. Extractables are one such challenge. Optimized multilayer tube solutions can provide lower extractables and improved barrier performance.

9:30 a.m. How to Meet New High Temperature and Low Extraction Challenges in Plastic Fuel Line Applications
Director Tubing Systems
Evonik Resource Efficiency (Germany)
Trends in powertrain developments in North America and in Europe are impacting the design of plastic fuel line systems. Two of the major trends are the temperature increase under-the-hood and the higher cleanliness requirements in the fuel system. High temperature multilayer tubing and low extractable multilayer tubing are reliable and proven answers for large serial production.

9:50 a.m. Networking Break

10:30 a.m. Smart Solutions for PHEVs
Program Director
Plastic Omnium (Belgium)
With the rapid expansion of PHEVs, it’s important to define the best solution for each market. Innovative refueling and E-valves facilitate efforts to commonize tank shells across markets and optimize costs for pressurized tank technologies.

11:00 a.m. Smart Fuel Delivery Module for Improved System Performance
Fuel Systems Staff Research Engineer
Delphi Technologies (U.S.A.)
A Smart Fuel Delivery Module (SFDM) expands the capabilities of the conventional FDM assembly that operates in open loop control. The SFDM uses an integrated pump controller, a brushless motor and fuel pressure sensor enabling closed loop pressure control with improved fuel consumption and reduced emissions. Additional system improvements enable self-diagnostics and serial communication to the engine management system.

11:30 a.m. China 6 Regulation and the PHEV Fuel System
Deputy Director
YAPP R&D (China)
PHEV fuel systems are analyzed under the conditions of China 6 including the impacts on tank pressure, consumer considerations and slosh behavior under all-electric mode. For PHEVs, OEMs show a tendency towards specific tank approaches. This leads to the need for patent investigation as twin sheet blow molding technology matures.

12:00 p.m. Lunch

1:00 p.m. Acid Resistant Polyoxymethylene (POM)
Application Development Engineer
Polyplastics (U.S.A.)
Fuel delivery modules required the development of a specific POM grade for fuel flanges, reservoirs and other related components. This grade has been shown to have greater than fifteen times the acid resistance of standard copolymer POM, while maintaining equal to or better physical properties.
1:20 p.m. Aliphatic Polyketone in Fuel Contact Applications  
Director of Applications Development  
PolySource (U.S.A.)  
Efforts are being made to obtain the re-approval of aliphatic polyketone for North American automotive applications especially for fuel contact devices. A progress report is presented on basic material testing, fuel exposure and zinc chloride resistance. Performance benefits using aliphatic polyketone in various fuel contact components are highlighted.

1:40 p.m. Why More Than DEF Immersion Data is Required to Assess Elastomers for DEF System Seals and Tubing  
Principal Automotive OEM Liaison and Senior Development Chemist  
Zeon Chemicals (U.S.A.)  
Selecting elastomers based on DEF exposure alone led to problems for several European OEMs. Fluids other than DEF were introduced into the system to provide a false positive reading to the level sensor. Elastomers offering resistance to both DEF and diesel will be presented.

2:00 p.m. KEYNOTE PRESENTATION  
Five Reasons to Prepare for the Impact of the Transportation Revolution  
Research Associate, Innovative Mobility Research Group  
University of California, Berkeley (U.S.A.)  
Economic, environmental, and social forces have quickly given rise to the “sharing economy,” a collective of entrepreneurs and consumers leveraging technology to share resources, save money, and generate capital. Major shared transportation modes are changing how people travel and are having a transformative effect on the way OEMs and public agencies plan, market, and sell mobility. Public agencies, OEMs, and cities can leverage electrification, information technologies and shared mobility to more intelligently and efficiently use resources.

3:10 p.m. An Industry in Transition - A Live Survey  

Refueling - Interfacing with the Consumer  

3:20 p.m. LIVE WEBINAR  
California Vehicle Fill Pipe Specifications: Potential Improvements  
Air Resources Engineer  
The California Air Resources Board (U.S.A.)  
CARB is considering an update to the vehicle fill pipe specification. Overpressure concerns leading to higher emissions are considered. The proposed changes to the fill pipe specification will be discussed including the development of a performance standard.

3:50 p.m. Improving Automotive Fuel System Design Using FLOW-3D Computational Modeling  
CFD Engineer  
Flow Science (U.S.A.)  
Fuel and propellant management systems can be subject to a wealth of design challenges such as split-back and premature shut-off. Given the complexity of such systems, a complete analysis of both the fluid and gas phases, that may also need to include inertial accelerations, is warranted during the design phase.

4:20 p.m. Consumer View of a Fuel System: A Proposal for a Change in Vehicle Filler Cap Design  
Director New Technology Management  
Kautex Textron (Germany)  
The usual consumers' interaction with a fuel system occurs via the fuel gauge in the dashboard and during refueling via the filler cap. The fuel gauge display has undergone constant evolution. Other than capless systems, filler caps have undergone little change from the consumers' perspective. With SCR systems, filler housings on diesel vehicles are more cumbersome. An approach to simplify the design of diesel vehicle filler caps is presented.

4:50 p.m. Cocktail Reception
7:30 a.m. Registration and Continental Breakfast

8:45 a.m. Welcome and Introductory Remarks
Dr. Joel Kopinsky, Managing Director
The ITB Group (U.S.A.)

9:00 a.m. Fuel Module with Two Pumps and High-Flow Aux Transfer for High Performance Cars
Product Engineering Supervisor and Staff Engineer
Delphi Technologies (U.S.A.)
High performance cars with high horsepower engines require extremely high fuel flow. Most of these vehicles use saddle-tanks requiring transfer jet pumps to transfer fuel from the aux side. A very high flow suction-type jet pump for these systems is presented.

9:30 a.m. Comparison of Diurnal and ORVR Carbon Canister Emissions between China 6 and US Regulations
Principal Engineer
Ingevity (U.S.A.)
US Tier 2/3 and China 6 evaporative emission regulations are striving towards the common goal to lower vapor emissions. The associated test procedures differ from each other in respect to fuel RVP and temperatures. The effect of these differences on diurnal and refueling emissions, is investigated. Design choices with regards to activated carbon type and carbon canister capacity/size are presented.

9:50 a.m. Techniques to Reduce Fuel Vapor Emissions at the Terminal Interface of Fuel Flange
Team Manager of Technical Support
Korea Engineering Plastics (Korea)
Automotive fuel flanges have advanced to require insert molding of electrodes. Lower emissions requirements demand the evaluation of possible fuel vapor leak paths and the implementation of solutions. A discussion of practical techniques to comply with emissions requirements and support modern manufacturing practices will be provided.

10:10 a.m. Networking Break

10:40 a.m. Water Injection Systems
Product Manager
Röchling Automotive (U.S.A.)
The injection of water into the combustion chamber has been shown to have a number of benefits for gasoline engines. The history of this approach together with its basic operation and benefits will be reviewed. System components and their related challenges will be discussed together with the required simulation tools.

11:10 a.m. Enhanced Gasoline Engine Performance with Water Injection: No Longer a Dream
Technical Leader
Plastic Omnium (Belgium)
Water injection applications are limited to specific high value applications. System complexity and the cost of onboard water management, together with injecting at the right pressure and dosing rate limits the use. An overview of water injection concepts and the potential impact on engine performance are described. A study of how a water storage and delivery system could be optimized to make it viable for all types of vehicles is presented.

11:40 a.m. Comparative Benchmark of Novel Heater Concepts Supporting RDE Components and Functionalities
Senior Manager - SCR
Kautex Textron (Germany)
Vehicle packaging and the resulting geometries of the DEF and/or water containers can lead to an intolerable amount of unusable volume
During extended frosty periods. In order to avoid this, various additional heater concepts are in the market. The lecture will provide a comparative overview of these concepts, as well as it will address the pros and cons.

12:10 p.m. Lunch

**Alternative Fuels - Gases and Electricity**

1:10 p.m. Barrier Materials for Traditional and Alternative Fuel Systems
*Business Development Engineer*
*Arkema (U.S.A.)*

Natural gas and hydrogen have emerged as new energy sources for passenger and commercial vehicles. The storage systems require high gas barrier performance. Using conventional fuel barrier materials for these new systems will require adaptation and/or innovation.

1:30 p.m. Adsorbed Natural Gas on Vehicles – Standards and Safety Considerations for Design and Fabrication
*Senior Lead R&D Scientist*
*Ingevity (U.S.A.)*

Standards are being developed for adsorbent-filled natural gas pressure containers on vehicles. A review of these standards together with comparisons between the standards is presented.

1:50 p.m. Carmakers’ Electric Vehicles Strategies: Platforms, Marketing and Charging
*Managing Director - Automotive Futures*
*University of Michigan (U.S.A.)*

As electric vehicles become part of every global automakers vehicle lineup, each OEM must decide if it is to develop entirely new platforms and designs or if it will use existing platforms and designs to meet their goals. Though there are only the first offerings by the manufacturers, they provide an interesting insight into how companies view these vehicles in their overall strategies. This presentation will evaluate OEM offerings in order to understand the advantages and disadvantages of each strategy.

2:20 p.m. An Industry in Transition - A Live Survey

2:30 p.m. Hydrogen Storage On-board Fuel Cell Electric Vehicles – Status and Challenges
*Technology Manager at Fuel Cell Technologies Office*
*Office of Energy Efficiency and Renewable Energy – DOE (U.S.A.)*

The presentation provides an overview of the Fuel Cell Technologies Office’s R&D portfolio supporting development of advanced hydrogen storage technologies. The presentation will provide information on DOE’s PEM fuel cell and hydrogen storage targets and their current status. Recent progress for on-board physical and material-based storage technologies for hydrogen will be discussed.

3:00 p.m. Optimal Integration of a Hydrogen Storage and Delivery System for 800 Km Range and 3 Minute Refill
*New Product Line Director*
*Plastic Omnium (Belgium)*

Electric vehicles are finding their way to the market as a zero emission Tank-to-Wheel solution. Battery Electric Vehicles, despite their many benefits, suffer from a lack of range, which limits their use for long distance traveling. A full recharging event takes up to several hours, and even fast charging devices take more than 20 minutes for only a partial charging of the battery. A 700 bar hydrogen storage system allows to refill up to 8 kg of hydrogen in 3 minutes, which corresponds to a range of 800 km. The challenge lies in integrating such a system without sacrificing trunk space while maintaining passenger compartment modularity.

3:30 p.m. Closing Remarks

Kuraray
MAHLE Filter Systems
National Research Council Canada
Plastic Omnium
Polyplastics
PolySource
Rayconnect
Sanoh Industrial
SGS Testing Services Group
Stant
TDK
A.Raymond / Rayconnect Inc.
Many automotive and truck customers prefer to use ARaymond™ Quick Connectors from Rayconnect because they answer their needs: ease of operation, locking safety, traceability, range diversity and integrated functions (valves, sensors, regulators). Our connectors are found in many types of fluid systems: fuel, fuel vapor, SCR, HVAC, engine cooling, battery cooling, oil cooling, power steering, brake vacuum and many other fluid applications.

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Fraenkische USA
Celebrating over 110 years in operation, Fraenkische has been the industry leader in the design and development of plastic tubing solutions. Fraenkische invented the corrugated tubing process in 1959, and we are still leading the way in cutting edge solutions for the ever changing marketplace. We strive to develop tailored solutions to suit the individual needs of our customers.

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Kautex Textron
As a full service supplier Kautex Textron thinks beyond its boundaries. In today’s fast changing automotive industry Human Machine Interface is one of the key sales driver. The presentation will provide an overview of the interfaces, how they have changed over time and propose a new way to design a HMI for a fuel/additive system.

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Kuraray
Kuraray, established in 1926 in Japan, has since evolved into a global specialty chemical producer supplying resins, chemicals and synthetic fibers to the automotive, consumer, industrial and medical markets. EVAL™ brand EVOH, characterized by its outstanding gas and fuel barrier properties and Genestar, a high barrier, heat resistant polyamide resin (PA9T), are particularly suited for fuel delivery and component applications.

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**Plastic Omnium**
Plastic Omnium is the world leader in automotive exterior parts and modules, fuel and emission control storage systems. Founded in 2000 as a French-based subsidiary of Plastic Omnium Group, Auto Inergy has pioneered breakthroughs in fuel and emission control technologies. From gasoline and diesel, to hybrid and plug-in hybrid vehicles, Auto Inergy offers a full range of energy storage system solutions making them the premier partner to fuel the vehicle of the future.

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**Polyplastics USA**
Polyplastics is a global leader in the development and production of engineering thermoplastics solutions – with a focus on POM, PPS, PBT and COC products. With more than 50 years of experience, our technical experts enhance manufacturing and product performance backed by a strong global network of R&D, production and sales resources. Polyplastics is able to create advanced solutions and expand customer value in a technically evolving market.

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**Stant**
Stant is a global leader in the design, development and manufacture of technology-driven fuel closure, liquid transfer, and vapor management sub-systems and products for the automotive OEM and industrial markets. Stant’s global footprint and technical expertise enables us to provide innovative solutions that exceed customers’ expectations and needs. Operational excellence provides our customers with reliable and cost competitive solutions.

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**The ITB Group**
The ITB Group was established in 1992 with a simple premise: to bridge the gap between developing a suitable technology platform and building a successful business. We are a highly specialized consulting firm with sub-specializations in acoustics, fuel systems, exhaust systems, plastic engine parts, interior/exterior systems and thermal management from a component and modular perspective.

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ITB Consulting Services

Developing / Implementing Strategic Vision
- Creating sustainable value
- Identify appropriate activities - product / customer portfolio optimization
- Globalization strategy
- Technology selection

Technology Feasibility Analysis
- Voice of the customer
- Market trends
- Competitive environment
- Apparent value

Capitalizing on Legislative Trends
- Fuel consumption & GHG developments
- Safety
- Emissions (exhaust and evaporative)

Optimizing Customer Base & Product Portfolios
- Value proposition (what and how products are offered)
- Resource optimization
- Customer portfolio
- Identify threats & opportunities

Leveraging Opportunities in the Competitor and Supply Base Arenas
- Competitor analysis
- Supply base optimization
- Make and buy decisions
- Tier One or Two positioning (tiering strategy)

Creating New Relationships
- M & A - target identification, due diligence & implementation assistance
- Technology licensing
- Product partnering
- Consortiums

Conference and Workshop Schedule

Plan now to participate in ITB’s upcoming automotive events. Opportunities to present, sponsor and/or exhibit are available.

- **Smart Automotive Surfaces** - October 10 and 11, 2018. Novi, Michigan, U.S.A.

For more information, please contact Bryan Eldredge, Program Manager at: beldredge@itbgroup.com or (1) 248-380-6310.