

Automotive Structures and Weight Reduction Strategies 2010

May 13 and 14, 2010
Sheraton Detroit Novi Hotel
Novi, Michigan U.S.A.

Final Program



Source: The ITB Group and Volkswagen AG

Sponsored by:



Automotive Structures and Weight Reduction Strategies

2010

AGENDA: Day 1 - May 13, 2010

Please note that proceedings are not available

7:30 a.m. Registration and Continental Breakfast

8:30 a.m. WELCOME and OPENING REMARKS

*Mitra O'Malley, Managing Director
The ITB Group (U.S.A.)*

Innovations in Structural Applications

9:00 a.m. Lightweight Structural and Energy Management Solutions for Automotive Interiors using EPP

JSP (U.S.A.)

Technology developments that have allowed the use of expanded polypropylene in lightweight automotive structures along with part applications will be presented. Advantages in combining insert molding with lamination so as to build structure and trim into one package to realize cost and weight savings will be demonstrated.

9:30 a.m. E=mc²

Shape Corp and NetShape International (U.S.A.)

This presentation will discuss a highly tunable pedestrian safety system. Stringent injury criteria with mass reduction of approximately 50 percent have been realized through innovative design.

10:00 a.m. Mid-Morning Break

10:30 a.m. Improved Glass-Fiber Reinforced Polypropylene for Structural Applications and Opportunities for Use of Thermoplastic Polyolefin in Body Panels

LyondellBasell Industries (U.S.A.)

LyondellBasell has developed a new generation of short glass fiber reinforced materials with improved stiffness and tensile strength which have replaced LGF in several applications. These new developments will be discussed in detail and application examples will be highlighted. The development of high melt flow rate resins and compounds which are successfully used in D-LFT processes will be presented along with an examination of state-of-the-art TPO materials suitable for body panel applications. Specific application examples will be provided.

11:00 a.m. Holistic Design Development Process for Vehicle Mass Reduction and Improved Fuel Efficiency

ETA Global Engineering (U.S.A.)

The Accelerated Concept to Product Process is a proprietary, performance-driven, holistic product design development method. The methodology offers four key benefits, including a demonstrated capability to reduce product development costs, reduce product mass, improve product performance and improve fuel efficiency based on the mass reduction results. This presentation will provide an overview of the product design methodology that was applied on the Future Generation Passenger Compartment projects and how it will continue to evolve in future phases.

11:30 a.m. Future Steel Vehicle

EDAG (U.S.A.)

An assessment of advanced powertrains and their impact on lightweight vehicle architecture is provided. Environmental, cost and vehicle layout implications of battery electric, plug-in hybrid electric and fuel cell electric vehicles will be discussed.

12:00 p.m. Lunch

Role of Adhesives in Mass Reduction

1:00 p.m. Enabling Lightweight Vehicle Design

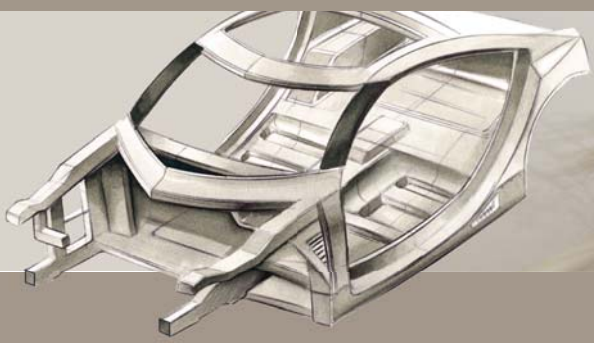
Henkel Corporation (U.S.A.)

This presentation will encompass technologies and supporting manufacturing methods which enable OEMs and suppliers to create mass and cost efficient structures. Technologies covered include lightweight structural composites, adhesives and innovative damping solutions.

1:30 p.m. Body-in-White Structural Solutions

Sika Automotive (U.S.A.)

OEMs depend on expandable inserts and structural adhesives for a wide range of structural applications and reinforcing solutions. This presentation will share the current state-of-the-art in this practice and focus on new developments in the industry driven by the need to comply with changing regulations.



2:00 p.m. Stronger, Lighter Hybrid Structures through Innovative Adhesion Promoter

Evonik Degussa (U.S.A.)

Hybrid components combining metal and plastic are increasingly being utilized in lightweight design of front-end modules and body support structures. An overview of Evonik Degussa's latest development, VESTAMELT®, a primer system based on copolyamides which markedly improves the bonding of steel and aluminum to glass-filled nylons will be presented. Test results showing increased strength and torsional stiffness in hybrid components using this adhesion promoter will be discussed.

2:30 p.m. Application of Structural Foam and Structural Adhesives in Delivering Mass Efficient Vehicle Body Designs

Dow Automotive (U.S.A.)

The focus of this presentation is to demonstrate the benefits of body cavity reinforcing products such as polyurethane structural BETAFOAM™ and body structural adhesive BETAMATE™ joining solutions in enabling OEMs to meet their mass and performance targets. Case studies will be presented while highlighting how alternative products can deliver mass efficient solutions while meeting or exceeding vehicle performance requirements.

3:00 p.m. Afternoon Break

OEM Strategies for Mass Reduction

3:15 p.m. Interdisciplinary Innovation in Lightweight Vehicle Design

University of Windsor (Canada)

Manufacturers, suppliers, and academic researchers are working diligently to design and test lightweight materials and applications that will assist in achieving stringent fuel economy requirements without adversely affecting vehicle performance related to durability, NVH and safety. As a result, there are new opportunities to realize innovative design strategies that will incorporate interdisciplinary approaches to design and development tasks. A research project that illustrates such an approach for an innovative vehicle structural design for mass production will

be described along with ideas for accelerating the design process in an effort to minimize design and development costs.

3:45 p.m. Mass Efficient Architecture for Roof Structure
Ford Motor Company (U.S.A.)

In an effort to improve vehicle safety during a roll over event, the National Highway and Traffic Safety Administration has proposed increasing performance requirements. In addition to safety concerns however, the cost of fuel and the potential for new fuel economy requirements is prompting automakers to look at ways to decrease mass of the vehicle structure. An initiative by The Auto/Steel Partnership to develop a roof architecture using advanced high strength steel materials and other structural elements to meet the new regulatory requirements with a minimum mass penalty will be presented. Project targets and testing with a focus on materials and processing concepts will be discussed.

4:15 p.m. Total Vehicle Approach to Cost Effective Vehicle Mass Reductions

Lotus Engineering (U.S.A.)

This presentation will review a design and analysis study that reduced vehicle mass while minimizing the total vehicle cost impact. Design approaches, material selections and processing/assembly methodologies were reviewed and examples selected for non-powertrain related systems were based on cost, mass and construction. The vehicle systems were quantified and summarized to create an overall mass and weighted cost estimate for a low mass vehicle.

4:45 p.m. Future Generation Passenger Compartment
General Motors (U.S.A.)

The Future Generation Passenger Compartment project demonstrated more than a 30 percent mass savings of the passenger compartment at cost parity relative to a typical 2005 baseline four-door five-passenger sedan. This presentation will discuss the design solutions, material choices and manufacturing processes used to realize project targets.

5:15 p.m. Evening Networking and Refreshments

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AGENDA: Day 2 - May 14, 2010

Please note that proceedings are not available

7:15 a.m. Registration and Continental Breakfast

8:15 a.m. **OPENING REMARKS**
Mitra O'Malley, Managing Director
The ITB Group (U.S.A.)

Role of Materials in Weight Reduction

8:30 a.m. **Weight Reduction Potential in Automotive Sealing Systems with Thermoplastic Polymers**
ExxonMobil Chemical (U.S.A.)

Today, key focus areas for the automotive industry include lowering fuel consumption and lowering emissions to meet legislated targets. Consequently systems suppliers to the industry are encouraged to reduce the weight of each component. This presentation will show that the sealing system offers a number of opportunities to achieve significant weight reduction, in particular by leveraging the versatility of thermoplastic elastomers (TPEs). Examples of innovative developments, their impact on system weight and performance and a market perspective of the development of TPEs in automotive sealing systems will be presented.

9:00 a.m. **High Performance Materials for Metal Replacement**
EMS-Grivory (U.S.A.)

This presentation will provide an overview of high performance polymers that have high mechanical properties allowing weight savings and cost reduction in the replacement of metals and die-casts.

9:30 a.m. **Materials and Technologies for Meeting Performance and Weight Reduction Goals in the Alternative Energy Vehicle Marketplace**
Bayer MaterialScience (U.S.A.)

As alternative energy vehicles (AEV's) become more prominent in the automotive marketplace, an even higher emphasis is being placed on holistic vehicle lightweighting. This presentation will detail the use of PUR composites for lightweighting structural components such as the underbody and liftgates and the adoption of lightweight polymers to replace traditional materials such as glass and steel in exterior applications. Innovative options for significant weight savings, part integration, aesthetics, design freedom and performance enhancements using engineering polymers will be presented.

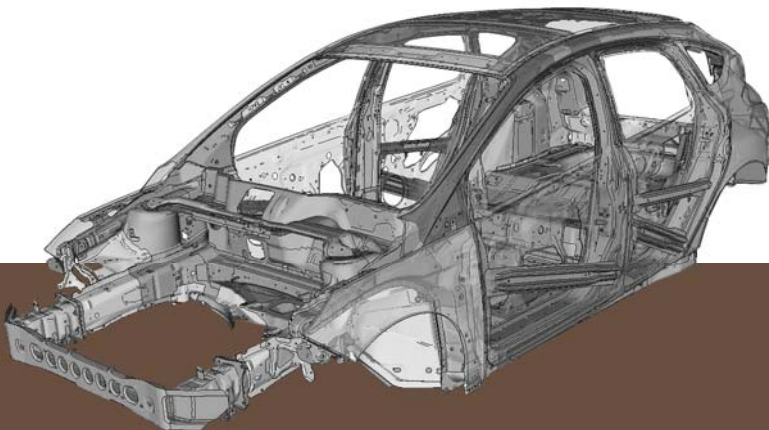
10:00 a.m. **Mid-Morning Break**

10:30 a.m. **Lightweighting with Magnesium**
Meridian Lightweight Technologies (U.S.A.)

Magnesium provides the automotive design engineer a wide array of product options to help reduce weight as much as 50 percent from current automotive structures. Advantages of lightweighting, along with case studies of several magnesium applications in the vehicle body, interior and powertrain are reviewed.

11:00 a.m. **Production of Long-Fiber Reinforced Automotive Components - Technology Update**

The challenge of developing suitable production technologies that enable large scale production of automotive composite components for lightweight applications will be discussed. The increase in part performance by local continuous fiber reinforcements as well as the necessary process modifications will be described together with an introduction to state-of-the-art advances in SMC molding of Class-A panels. The outlook for a new process development for in-line processing of





thermoset composites and an update on long fiber spraying and resin transfer molding for automotive parts is provided.

11:30 a.m. Status of Polymer Matrix Composites for Lightweight Automotive Applications

University of Michigan-Dearborn (U.S.A.)

An overview of current and future polymer matrix composite applications for lightweight automobiles will be discussed. The presentation will focus on technical issues and challenges that need to be addressed for increasing the use of these materials in automotive body and chassis components. An overview of the research and development work at the University of Michigan-Dearborn on thermoplastic matrix composites for producing lightweight structural components will be highlighted.

12:15 p.m. Lunch

Innovations in Modules

1:00 p.m. Light Weight Magnesium Structural Carrier for Vehicle Front-End Module

HBPO North America (U.S.A.)

The development of a full, low density magnesium carrier for front-end module applications will be discussed. Specific attributes of this approach such as higher structural stability with reduced weight will be highlighted. Design considerations, corrosion and material manufacturing issues, along with a look at aluminum crash management systems, will be provided.

1:30 p.m. Why Composite Tailgates and Rear-End Modules?

Plastic Omnium (U.S.A.)

An analysis of an array of options for tailgates and rear-end modules is presented. For each approach an assessment is made of performance, integration potential, cost and mass reduction opportunities.

2:15 p.m. Lightweight Composite Tailgate with Innovative Motorization and Anti-Pinch Concept

Brose (Germany)

A new lightweight tailgate concept with an optional contact-free anti-pinch sensor system jointly developed by Plastic Omnium and Brose will be discussed. Benefits of the module including weight savings and cost compared to standard tailgates along with advantages and safety of the new motorization system will be highlighted.

2:45 p.m. Closing Remarks

“Fat men cannot run as fast as thin men, but we build most of our vehicles as though deadweight fat increased speed.... I cannot imagine where the delusion that weight means strength came from....” - Henry Ford

Exhibitors

Auto/Steel Partnership

Dow Automotive

EMS-Grivory

Evonik Degussa

Henkel

Plastic Omnium

Sika Automotive

Ticona Engineering Polymers

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List of Sponsors and Exhibitors

Henkel

Henkel is the global leader in NVH, structural and sealing solutions for the automotive industry. With innovative and advanced technologies, as well as comprehensive design and engineering support, Henkel provides complete vehicle body assembly solutions. These solutions enable customers to achieve vehicle weight reduction, reduce structure-borne noise and increase structural integrity. Leading brands include Terophon® High Damping Foam (HDF), Terocore® and Terokal® structural adhesives.

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Plastic Omnium

Number one worldwide supplier in plastic auto exterior parts. Plastic Omnium continues its commitment to making vehicles lighter by finding new applications for plastic in the automobile. As a global automotive equipment manufacturer, Plastic Omnium helps carmakers to develop innovative solutions with a shared goal of making automobiles safer, more attractive and more environmentally friendly.

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Ticona Engineering Polymers

Celstran® LFRT for weight reduction, parts consolidation and metal replacement – Celstran® LFRT offers a combination of stiffness and toughness unparalleled by conventional short fiber reinforced thermoplastics. The Celstran® LFRT product range comprises long-fiber reinforced thermoplastics that can be tailored to meet customer requirements. Almost all semi-crystalline and amorphous thermoplastics are suitable as matrix materials to meet demanding customer applications.

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Auto/Steel Partnership

The Auto/Steel Partnership is a unique consortium consisting of Chrysler, Ford Motor Company, General Motors and six major steel producers, including AK Steel, ArcelorMittal Dofasco, ArcelorMittal USA, Nucor, Severstal North America and United States Steel. The consortium brings competing steel and automotive manufacturers together in a pre-competitive, collaborative environment to achieve common goals.

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Dow Automotive Systems

Dow Automotive Systems is a leading provider of polyurethanes, elastomers, films, fluids, adhesives, emissions solutions and acoustic-management materials to the global transportation industry. Dow Automotive Systems is developing industry-leading solutions to address a wide range of critical market needs: increasing energy efficiency, improving safety/health, reducing exhaust emissions and enhancing vehicle quality/appeal.

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EMS-Grivory

EMS-Grivory, a manufacturer of specialty nylons, brings weight and cost saving solutions with high performance nylon materials for metal replacement. Grivory GV was created to replace metal. Extreme strength and stiffness in any environment, excellent molded surface and vibration damping make Grivory GV the choice for metal to plastic conversions.

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Evonik Degussa

Evonik Industries is the creative industrial group from Germany which operates in three business areas: chemicals, energy and real estate. Evonik is a global leader in specialty chemicals and high performance polymers. Their strengths are creativity, specialization, continuous self-renewal and reliability. Evonik is active in over 100 countries around the world.

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Sika Automotive

Sika Automotive, a division of Sika Corporation, located in Madison Heights, Michigan USA, is a global automotive company. Sika Automotive's product range features high quality acoustics, bonding, reinforcing and sealing solutions. Sika Automotive, with its in-house technology center, focuses on delivering chemical, design, engineering, validation and optimization solutions to its OEM customers.

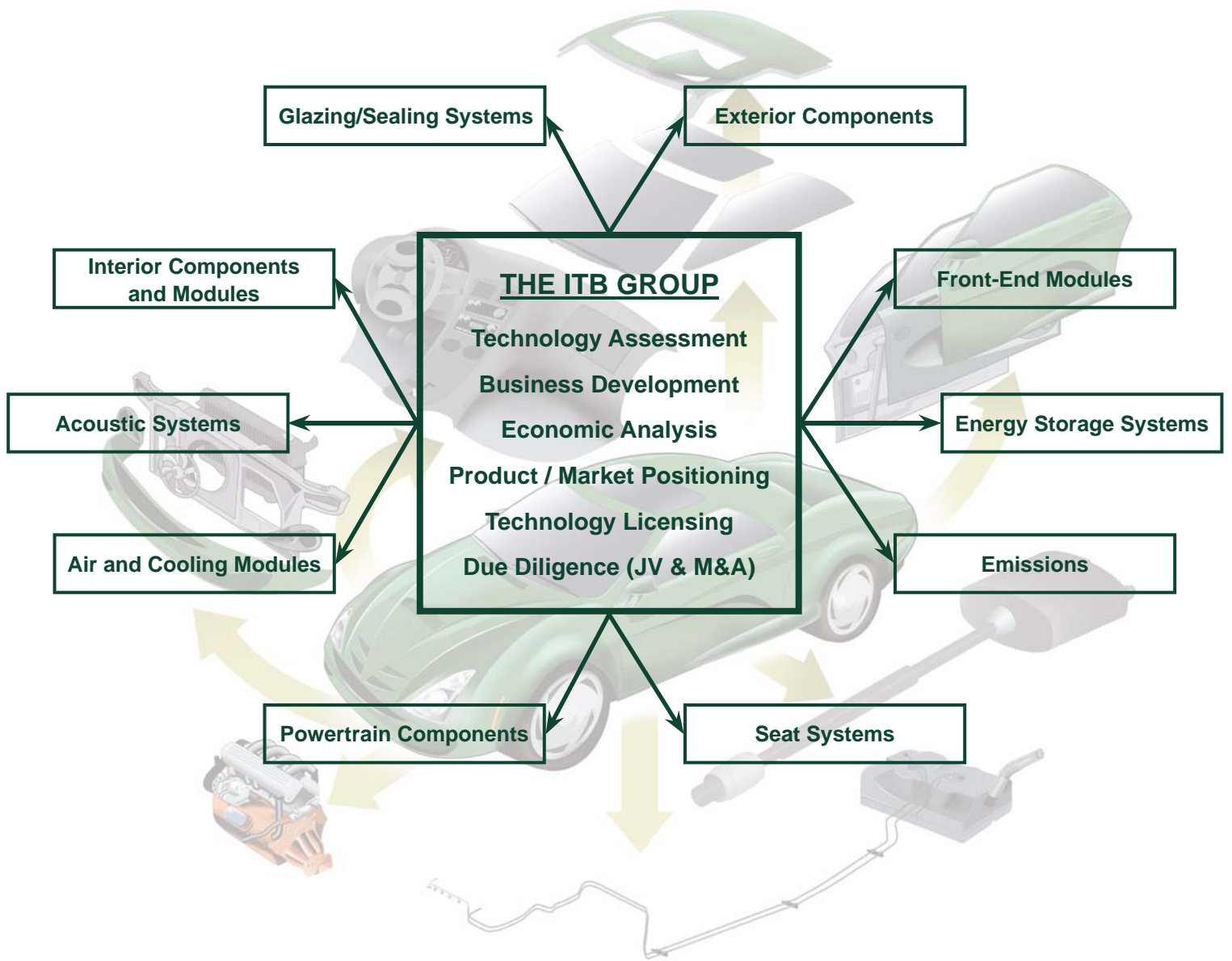
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