Trends in Automotive Interiors

In today’s automotive industry, OEMs and suppliers are working hard to set themselves apart. During this talk, we will discuss how vehicle interiors are influenced by everything from nature to fashion and how manufacturers and suppliers are addressing these trends.

• The exterior grabs you, the interior holds you. Consumers now expect luxuriously designed interiors to match the highly designed exterior, no matter the vehicle segment.

• Designers are driven by insightful and ingenious ideas. Defining new standards in vehicle interior design, style, performance, and comfort is the result of a multitude of influences and inspiration.

• The fashion industry is bringing forward new elements of design in textiles, textures, patterns, and stitching. Learn how automotive designers can integrate that industry’s best practices into well-crafted interiors.

• The vehicle’s interior is becoming an outlet for personalization and creativity. It is helpful to look outside the automotive industry to stay on top of trends, apply uncommon expertise, and develop new product and process ideas.

• Not only do today’s interiors look and feel like fashion showpieces, they can meet and even surpass our industry’s needs in terms of cost, form, and function, durability, low weight and low mass. All require technical ingenuity.
Presentation #2: Roger Young, Robert Eller, Robert Eller Associates LLC (USA)

Current and Future Prospects for TPOs and TPEs in Interiors

Compound technology and fabrication methods are enlarging the performance profiles for TPOs and TPEs in interiors. This presentation explores enabling technologies, targets and paths to innovation in interiors, including foams, soft-touch technology, skins, body/glazing seals, mats, and acoustics within the context of a shifting supply chain, globalization, and shifting performance requirements.

Presentation #3: Dan Feeney, Haartz Corporation (USA)

New Innovations in Moldable TPO Laminates for Automotive Interiors

Automotive Interior skin technologies are constantly evolving to meet the many and ever-changing industry requirements. Innovation has focused on TPO-based materials with a soft haptic, while meeting the increased challenges of chemical resistance and remaining environmentally friendly. Haartz has been at the forefront developing new TPO laminate constructions as solutions to this challenge. By using years of manufacturing expertise, we have created a portfolio of highly engineered materials to form over even the most complex shapes.
Coatings for Automotive Interiors

**Presentation #4: Jim Keller,**
United Paint & Chemical Corporation (USA)

**Design of Automotive Interior Coatings**

Coatings for automotive interiors provide improved aesthetics (color harmony, uniform gloss), haptics or tactile sensation (soft touch, smooth and slippery feel), durability (weatherability, scratch and wear resistance), and chemical resistance. This presentation explains why coatings are used and the special challenges in developing coatings for TPOs and engineered polypropylenes. Function of different components of the coatings will be explained in the context of meeting specific end-use property requirements.

**Presentation #5: John Millea,**
Dr. Pravin Sitaram, Kristine Togneri,
The Haartz Corporation (USA)

**Overcoming the Challenges Posed by Consumer Products used in Automotive Interiors**

As consumers try to resist microbes, the sun, and more, they are transferring chemicals from such products as hand sanitizer and sunscreen to the surface of their vehicle’s interior. The molded soft-trim materials in automotive interiors have a new challenge to resist these chemical attacks. To combat the challenge, extensive R&D efforts at Haartz have led to new TPO formulations and lacquers that achieve greater chemical resistance while maintaining a balance between performance, processing, haptics, and environmental responsibility.
Development of Global Emission-Compliant Topcoats and Primers for TPO Materials

Days of a “new car smell” are over. VOC emissions are no longer tolerated because of legislation, OEM-specific car interior guidelines (based on toxicology), and consumers. Stahl, a leading manufacturer of coatings for car interior-trim applications, is launching a new series of coating products that not only comply with the most stringent OEM requirements for emissions and aesthetic and technical performance, but also takes it one step further by introducing coatings with an ongoing and increasing content of renewable raw materials.

TPO 材料顶漆和底漆全球排放标准的发展

对于“新车味道”喜爱的时期已经结束。由于法律，原始制造商遵循的特定汽车内饰件指南（基于毒理学），和消费者的要求，对挥发性有机化合物（VOC）的排放量必须加以控制。Stahl 作为汽车内饰涂料的主要制造商，推出了一个新的涂料系列产品，不仅符合最严格的原始制造商的排放要求，以及美学和技术特性要求，而且进一步应用了可再生的原材料。
Rigid TPO Compounds

Presentation #7: Dr. Laura Shereda, Asahi Kasei Plastics North America, Inc. (USA)

Understanding Emissions of PP-Based Resin Compositions

As the world becomes more concerned with air quality and carbon footprint, in the automotive industry OEMs have begun to add emissions criteria to their parts and prints. These tests generally include measurements of odor, fog, and VOCs. Asahi Kasei has performed extensive testing to determine how the results of each test are related to changes in formulation, processing, and molding. This presentation will provide an overview of emissions in polypropylene compounds.

Presentation #8: Emily Fu, Alec Lang, Reliable Analysis (Shanghai) Inc. (China)

Continuous Optimization of Interior Air Quality

As we all know, more and more people are paying attention to vehicle interior air quality. In order to improve the vehicle interior air quality, protect human health, and promote the automobile industry’s technical progress, the Chinese government decided to revise the standard GB/T 27630-2011 and convert it to a compulsory standard. The new draft, published on Jan. 2016 shows much stricter requirements. This presentation will focus on the different emission tests and the change in emission requirements over time.
Meeting the Challenge of Delivering Global PP Compound Solutions

Today, automotive OEMs demand higher performance from PP compounds to successfully address key challenges (i.e., enhanced aesthetics, safety, and weight reduction). OEMs also demand global grades that are readily available locally. Global grade design is complex and challenging because of regional differences in raw material profiles. However, globally unified PP compound performance profiles can be achieved, as this presentation will demonstrate, by focusing not only on material compositions, but also properties critical to success.

Presentation #9: Dr. Linda Havermans, SABIC (The Netherlands)

Meeting the Challenge of Delivering Global PP Compound Solutions

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Questions?
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e: scott@compositesworld.com | p: 513-338-2189
Presentation #10: Marco Pan, Trinseo Automotive (France)

Enable Lighter Designs: The Renault Espace Full TPO Liftgate

In a joint project, Renault and Trinseo developed a full thermoplastic liftgate solution, which was commercialized and implemented on the serial production of the 2015 Renault Espace. The solution involved replacing metal with plastic on a key vehicle component. The innovative aspect was the use of a single thermoplastic material with different fillers for a mono-material liftgate. The final design achieved optimal dimensional stability, which had been considered the main challenge.

Presentation #11: Dr. Linda Havermans, Bhuwneesh Kumar, SABIC (the Netherlands)

Achieving Weight Reduction and a Balance of Properties with PP Compounds in Both Interior and Exterior Applications

The automotive industry is challenged to remove weight to improve fuel efficiency and reduce tailpipe emissions. Smart design, like ribbing, can get weight out in semi-structural plastic parts, but not in less structural parts produced from PP compounds. For some interior parts, a challenge is to achieve low temperature impact resistance while maintaining (or even increasing) stiffness without processing penalties. This presentation provides innovative approaches to save weight, with minimal tradeoffs, and an excellent property balance.
Presentation #12: Dr. Laura Shereda, Vaibhav (Vive) Apte, Asahi Kasei Plastics North America, Inc. (USA)

New Developments in Talc and Cellulose Fiber-Reinforced PP for Automotive Interior Trim Weight Savings

Asahi Kasei Plastics has recently developed several new PP compounds based on cellulose fiber and/or that also include high-flow, strength and stiffness talc-filled PP grades. These provide equivalent performance at reduced weight. The use of these new PP compounds that provide an equivalent level of stiffness with lower carbon footprint will be discussed in the context of material replacement to achieve a value/performance proposition.

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Presentation #13: Dr. David Brands, Angel Yanev, SABIC (The Netherlands)

Weight Reduction Technologies for Long Glass-Reinforced Polypropylene

Semi-structural plastic parts, such as front-end module carriers, are typically designed using complex geometrical shapes and ribbing to help take weight out. For less structural parts (i.e., instrument-panel carriers, door modules, etc.), mass reduction is usually achieved by reducing lowering wall thickness or density (such as by using foamed parts). This study compares different weight reduction technologies — chemical foaming, physical foaming, and thin-wall compact injection molding — applied to a long-glass fiber-reinforced PP composite resin to help define optimal performance.

Presentation #14: Dr. Laura Shereda, Tom Howie, Asahi Kasei Plastics North America, Inc. (USA)

Welding Improvements with a Focus on High Strength Glass-Reinforced Polypropylene

Historically, welding of semi-crystalline polymers is more difficult than with amorphous polymers. When we determine the total strain energy of the material, we can greatly increase the strength of the weld. Strain energy optimization will be investigated by looking at several welding parameters and the composition of the material.
Presentation #15: Piergiovanni Ercoli Malacari, IMI Fabi SpA (Italy)

HVT Extra: Introducing a New Talc for Best Performance Tradeoffs

IMI Fabi has developed a new product (HVT Extra), which is a highly delaminated talc that provides outstanding stiffness when compared to standard micronized talc normally used in TPO compounds. Large platey particles ensure very-high rigidity in polyolefins using the new filler, while retaining other mechanical properties.

The innovative compaction process used to produce the new product enables a truly free-flowing, dust-free powder in every condition and does not show any bridging or funneling during handling. Performance results with the new product in conventional TPO compounds will be compared with standard talc solutions to demonstrate potential applications.
Presentation #16: Dr. Sam He, Inteva Products LLC (USA)

Discussion of Thermoplastic Concentrates / Additives and Automotive Interior Applications

Thermoplastic concentrates / additives are needed for material properties and processing, and for product functions and performance. This presentation discusses some key requirements and essential expectations for concentrates / additives and their suppliers. The discussion includes additives, processing aids, color and colorants, surface appearance quality of final components, and the end-user’s experience. The presentation covers the expectations of automotive-interior business trends, innovation, cooperation in development, supply quality, and delivery, etc.

Presentation #17: Jungdu Kim, J. Mara, T. Schmutz, HeeJung Kwon, K. Keck, B. Iyer, Songwon Industrial (South Korea)

UV Product Developments for TPO Automotive Applications

This presentation will begin by providing an overview of the photodegradation and light stabilization of polyolefins and the chemistry and structure-activity relationships in hindered amine light stabilizers (HALS). It will end with the introduction of new synergistic UV stabilizer packages developed in partnership with Sabo to achieve increasing performance demands in the outdoor weathering of polyolefin-based applications, particularly automotive TPO components for interior and exterior.
Presentation #18: Şerif Erdoğan, Şebnem Tayyar, Can Ozer, Elastron Kimya (Turkey)

Mechanical-Physical and Weathering Properties of New “MATT SEBS” Series for Weatherseal Applications

This presentation discusses the mechanical-physical, rheological, and weathering properties of non-crosslinked “MATT SEBS” compound, which is designed as an alternative to EPDM/PP and crosslinked TPE-S. EPDM/PP-based thermoplastic vulcanizate is mainly used as a material for different types of automotive weatherseal applications, including beltline seals and glass-run channel seals. The new high-performance MATT SEBS-based compounds have competitive properties, including lower compression set at higher temperature, low gloss value, good weathering resistance, higher physical and mechanical properties, and similar flow properties with EPDM/PP.

報告 #18: Şerif Erdoğan, Şebnem Tayyar, Can Ozer –Elastron Kimya (Turkey)

新型“MATT SEBS”复合物的机械-物理和耐候性能以及其在汽车密封条上的应用

为了替代EPDM/PP和交联TPE-S，本文研究了非交联MATT SEBS复合物的机械-物理、流变和耐候性能。基于EPDM/PP的热塑性硫化橡胶主要用于汽车密封方面（包括密封条和玻璃运行通道密封），而与之加工流动性能类似的新型MATT SEBS复合物则拥有更多优势，如高温成型压力较低，低光泽值，更好的耐候性以及物理-机械性能等。
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Now in its 18th year, the show is the world’s leading automotive engineered polyolefins forum featuring 60+ technical presentations, keynote speakers, networking, receptions, & exhibits that highlight advances in polyolefin materials, processes, and applications technologies as well as a growing range of thermoplastic elastomers (TPEs) and thermoplastic vulcanizates (TPVs). This year’s show will be held Oct. 2-5, 2016 at the Troy-Marriott (Troy, Michigan) in the suburbs of Detroit.

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THE SPE TPO Automotive Engineered Polyolefins Conference typically draws over 800 attendees from 20 countries on 4 continents who are vitally interested in learning about the latest in rigid and elastomeric TPO as well as TPE and TPV technologies. Fully a third of conference attendees work for a transportation OEM, and nearly 20% work for a tier integrator. Few conferences of any size can provide this type of networking opportunity or put you before such an engaged, global audience interested in hearing the latest olefin advances. Interested in presenting your latest research? Abstracts are due April 18, 2016 and Papers/Presentations on July 29, 2016. Email abstracts/papers to TPOpapers@auto-tpo.com or fill out the online form at: http://auto-tpo.com/index.php/sessions/2016-speaker-application

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Injection molding with microcellular plastics is capable of producing parts with excellent dimensional stability while using less material and energy, lower injection pressure, and a shorter cycle time. As a result, microcellular injection molding has found broad applications in automotive products, business equipment, and various industrial applications and is applicable to TPO materials. In spite of these advantages, however, wider adoption of this promising process has been limited due to its inherent drawbacks, such as surface defects and inferior mechanical properties compared to conventional solid injection molded parts. This talk will present recent developments of microcellular injection molding that employs gas-laden and ready-to-foam pellets to realize mass production of foamed injection molded parts and co-blowing agents as well as microcellular nanocomposites and blends that offer improved mechanical properties or ductility using the microcellular injection molding process.
Presentation #20: Wu Jie, JSR (Shanghai) Co. Ltd. (China)

Bonding Properties & Structure between TPVs and EPDM Vulcanizates for Automotive Profiles

Compared with cured rubber, olefinic-based thermoplastic vulcanizate (TPV) elastomers offer both cost savings (using less labor at higher process efficiency) as well as environmental benefits (due to lower carbon emissions and low mass). A new TPV grade (EXCELLINK) has been developed by optimizing the polypropylene matrix to have lower crystallinity and higher molecular weight. In this presentation, test results will be reviewed to show that the new material provides excellent adhesion to cured rubber, compression set, friction durability, and soft feel in an automotive door weather seal application.

Presentation #21: Dr. Shih-Po (Tober) Sun - CoreTech System Co., Ltd. (China)

Simulating Composite Manufacturing with Moldex3D

The success of composites simulation requires an understanding of material properties, process mechanisms, and simulation integration between design, analysis, and manufacturing tools. This presentation will describe how the Moldex3D solver tackles different processing techniques, and how the lab characterizes thermal and flow properties of the materials.
Presentation #22: M. Jamali, R. Bagheri, O. Dadgari, A. Ghasemi, Parsa Polymer Sharif Co. (Iran)

**Correlating Scratch Visibility with Mechanical Behavior of TPO Compounds**

Goal of the current research is to better understand the role of the plastic matrix on scratch visibility in common formulations for interior trim. Two different compounds including a PP-elastomer and a PP-elastomer-filler were utilized. These materials could represent automotive door-panel and instrument-panel compounds, respectively. Scratch visibility on the grained surface was evaluated and correlated with the observations made in tensile, bending, and hardness testing of the compounds. Scratch path was analyzed using optical and scanning-electron microscopes. Strain at yield and stress whitening of the polymer were found to have considerable effects on scratch visibility.

Presentation #23: Dr. Sassan Tarahomi, International Automotive Components Group (USA)

**TPO Scratch & Mar Predictability - Part 1: Simulation**

Materials used in automotive interiors include many filled and unfilled PP and TPO grades. With increased competition and materials improvement, customers expect much better performance for the interior materials used in their cars. The traditional method of testing grained plaques for scratch and mar does provide directional performance data but is very time consuming. This presentation discusses scratch and mar predictability for PP and TPO products by utilizing CAE analysis.
Presentation #24: Dr. Sassan Tarahomi, International Automotive Components Group (USA)

TPO Scratch & Mar Predictability - Part 2: Building the Surface-Characteristic Database

This presentation is a continuation of the information presented as Part 1: Simulation. The FEA method is used to analyze surface damage by scratch and mar. The scope of this presentation is to present the extensive work completed in building the database. Scan and discretization of interior automotive surface textures and further discussion in the accuracy of simulation versus physical testing with confirmation runs are discussed in this paper.

Report #24: Sassan Tarahomi 博士- International Automotive Components Group (USA)

TPO 耐划伤和擦伤性能预测 - 第二部分：构建表面-性能数据库

本报告是第一部分：模拟部分的延续，通过 FEA 方法分析表面划伤和擦伤。报告的主要内容是展示在构建数据库过程中的大部分工作。本文主要对汽车内饰表面纹理进行扫描和离散分析，并通过实验和模拟结果的对比来验证分析模拟的准确性。
Innovative Compounded TPO Materials for Automotive Applications

A series of innovative polypropylene material solutions have been developed to meet automotive lightweight and environmental-protection requirements. These technologies include high-flow grades for thin-wall applications, low-density, long-fiber-reinforced, low-emission, anti-scratch, bloom-free, and tacky grades, soft-touch materials, imitation-flocking grades, and paint-free materials among others. This presentation will discuss validation of these materials on automotive parts with a focus on part-design optimization, CAE analysis, process capability, and part testing.

Next-Generation Additives for Scratch Improvement of Auto Interior Talc-Filled Polypropylene Parts

The automotive industry continues to push for parts that are more durable yet environmentally friendly. This presentation discusses the next generation of siloxane masterbatch additives for talc-filled polypropylene compounds designed for automotive interior parts. The technology provides excellent scratch performance at lower dosage levels than previously achieved while minimizing impact on mechanical properties. Additionally, they offer the best combination of properties including excellent scratch resistance, long-term heat and UV stability, low fogging, and low VOC generation.
Recent Advances in Soft-Touch Feeling Material

Soft-touch feeling material (Softell) provides high quality finished part surfaces with soft touch and matte surface without painting, as well as excellent scratch resistance and surface robustness. The parts made of these material feature very good noise-dampening properties, and better VOC emission performance on interior parts. Recent advances in the grades demonstrated further improvements in the soft-touch feeling.

Low VOC Automotive Interior with New Developments on PP Compounds

After the updated regulation release of GB 27630 in early 2016 for automotive cabin hazardous VOC emission control, more and more attention is being given by key tiers and OEMs to this topic. New technology developments in PP compounds for reduction of hazardous VOC emission on interior applications will be discussed in this presentation.

報告 #27: Roger Liu, LyondellBasell Industries (China)
软触觉材料的最新进展

软触觉材料（Softell）提供了高质量精巧的制件表面，使得制件表面具有柔软触觉和没有着色的无光泽的表面，同时具有优秀的耐刮伤性和表面坚固性。用这些软触觉材料制成的制件有着非常好的噪音抑制特性，并且对于汽车内饰件有着非常好的挥发性有机化合物排放特性。最新的发展证明了这种软触觉材料已经得到了很大的改善。