We’re providing the best to automotive and we’re here to serve you.

Sumitomo Chemical and our Sumika Polymers automotive group supports the global auto industry by creating innovative products that push the technology envelope. But we don’t stop there. Our facilities located in every major region, support local economies, preserve the environment and focus on problems facing society.

Sumitomo Chemical provides the best of both worlds – delivering sustainable automotive solutions that are safer and more cost effective, while working to enrich lives throughout the world.
Welcome to the 2016 SPE Global TPO Conference

Thank you for attending the 18th-annual SPE® TPO Automotive Engineered Polyolefins Conference, the world’s leading automotive polyolefins forum. On behalf of our hardworking planning committee and all of SPE, we welcome you to the show and wish you a very successful event.

Whether you’re here to present a paper, exhibit your company’s products and/or services, or to find solutions to pressing engineering challenges, we hope you find what you’re looking for at this year’s show.

This is an exciting year for our conference and it looks like we’ll set a lot of records:

- We expect more than 900 guests from around the world.
- We have our largest technical program ever (over 70 presentations in ten technical tracks in three parallel sessions throughout the event)
- Two special workshops on early evening Sunday.
- We have our largest exhibition ever thanks to the support of a record number of sponsors and over 80 exhibitors.

Additionally, we have five exciting keynote speakers who are going to help you better understand the complex web of trends and market forces at work in our industry today and that even now are shaping our tomorrow. Not only will you leave here better informed than when you arrived — assuming you visit our sponsors and catch our technical program — but you also should leave with lots of new contacts. That’s because we’ve built numerous networking opportunities into our 2016 program.

In addition to three receptions (Sunday, Monday, and Tuesday evenings), and daily breakfasts and lunches (Monday through Wednesday), we’ve also built in morning and afternoon breaks into the program so you can ask questions, meet new people, grab a beverage, and avail yourselves of the tremendous amount of collective automotive-plastics knowledge assembled at this venue.

We’d like to acknowledge all the effort our committee of volunteers have expended helping bring this year’s program to you. Our team is hard at work on this conference 11 months of the year. If there’s something we could do better, please don’t hesitate to tell a member of our committee so we can discuss it in our postmortem. If there’s something we did right, please don’t hesitate to tell us that too. We’re always striving to make this event better.

Sincerely,

Dr. Sassan Tarahomi  
Conference Co-Chair  
International Automotive Components (IAC) Group  

David Okonski  
Conference Co-Chair  
General Motors Co.
MATERIAL SOLUTIONS

What can Washington Penn design for you?

Custom compounding through WPP can lead to:

- Weight Savings
- Improved Performance
- Cost Savings

Key Technologies:

- Mineral Reinforced
- Glass Fiber Reinforced
- TPO
- Soft Touch TPE
- Pro-Touch™
- Lightweight
- Scratch & Mar
- Low Blush
- UV Stabilization
- Masterbatches
- Flame Retardants
- Custom Colors

www.washingtonpenn.com
+1 724-228-1260
Session Co-Chairs

Interior Soft Trim: Skins & Foams
Robert Eller, Robert Eller Associates LLC
Dr. Sam He, Inteva Products, LLC
Lightweighting of Polyolefin Parts
John Haubert, FCA US LLC
Normand Miron, Washington Penn Plastic Co., Inc.
Surface Enhancements
Dr. Rose Ryzt, IAC Group
Jeff B. Crist, Ford Motor Co.
Jim Keller, United Paint & Chemicals Corporation

Process Enabling Technologies
Kurt Anthony, Washington Penn Plastics Co., Inc.
Dr. Suresh Shah, retired-Delphi Corp.
Modeling for Performance Prediction
David Helmer, General Motors Co.
Li Lu, Ford Motor Co.
Hanno Van Raalte, Autodesk, Inc.

Rigid Polyolefin Compounds
Mike Balow, Asahi Kasei Plastics North America, Inc.
Ermanno Ruocco, Mitsui Plastics, Inc.

Advances in Automotive Polyolefins
Neil Fuenmayor, LyondellBasell Industries
Martha Katz, Ford Motor Co.
Adhesives & Coatings for TPOs
Dr. Pravin Sitaram, Haartz Corp.
Hoa Pham, Freudenberg Performance Materials

Sustainability & Bio-Based Materials
Susan Kozora, IAC Group
Dr. Alper Kiziltas, Ford Motor Co.

TPOs for Vehicle NVH Control
Jim Hemphill, Dow Elastomers
Joel Myers, Hyundai America Technical Center, Inc. (HATCI)

Staff Support
Karen Rhodes-Parker, SPE Detroit Sect.
Secretary
Jim Keller, United Paint & Chemical
Treasurer
Tom Powers, retired-Delta Polymers

House
Bill Windscheif, Advanced Innovative Solutions
Timeline / Job Descriptions
Dr. Sassan Tarahomi, IAC Group
Bill Windscheif, Advanced Innovative Solutions

Keynote Speakers
Bill Windscheif, Advanced Innovative Solutions
Nipponi Rao, RAO Associates

OEM Participation
Neil Fuenmayor, LyondellBasell Industries
Tom Pickett, General Motors Co.
John Haubert, FCA US LLC
Scott Aramian, Advanced Composites Inc.

USB Drives / Online Access
Sanjay Patel, Borealis AG
Neil Fuenmayor, LyondellBasell Industries

Scholarships
Ermanno Ruocco, Mitsui Plastics, Inc.
Sanjay Patel, Borealis AG
Dr. Sassan Tarahomi, IAC Group
Dr. Norm Kakarala, retired-Inteva Products LLC
Bill Windscheif, Advanced Innovative Solutions
David Okonski, General Motors Co.

Plaques / Awards / Part Competition
Nippani Rao, RAO Associates
Dr. Suresh Shah, retired-Delphi Corp.

Committee Member Recruitment
Dr. Sassan Tarahomi, IAC Group
David Okonski, General Motors Co.

E-touches / Proceedings Book
Dr. Laura Shereda, Asahi Kasei Plastics North America, Inc.
Jill Gorter, JPI Creative
Jim Alexander, Maple Press

Conference Feedback
Dirk Zinkweg, The Dow Chemical Co.
University Students
Dr. Sassan Tarahomi, IAC Group

Day of Conference Staff Support
Rob Philp, A. Schulman Inc.
Ed Barse, Advanced Plastic Consultants LLC
Students from SPE Chapters

Advertising/PR
Karen Rhodes-Parker, SPE Detroit Sect.
Jill Bahm, PenPix Creative

Website
Marc Bahm, BASF Corp.
Jill Bahm, PenPix Creative
Karen Rhodes-Parker, SPE Detroit Sect.

TV / News Media
Ron Price, Global Polymer Solutions

Audio/Video/Computers/Smartphone App
Ron Price, Global Polymer Solutions
Rob Philp, A. Schulman Inc.

APP
Richard Umemoto, Magna

Signs/Posters
Dr. Sassan Tarahomi, IAC Group
Jill Gorter, JPI Creative
Suzanne Lee, That Color
A Perspective on How TPO is Helping the Automotive Industry Meet Today’s Challenges

The global Automotive Industry continues to evolve rapidly. The industry itself is experiencing remarkable alterations in future customer usage and requirements. In the future, OEMs need TPO innovation from all sectors of our plastics industry – material suppliers, parts suppliers, painters, texture houses, etc. I will touch on GM’s perspective of the immediate challenges we are facing and then discuss some of the successful processes we developed for incorporating innovative TPO ideas in our current product offerings.

Jackson began her career in GM in Industrial Engineering at Pontiac Motor Division. She held project engineer positions in Human Factors Engineering and was Engineering Group Manager of Interior Systems for Minivans. She has been Director of Exterior Systems, Body Product and Manufacturing Systems and Body Validation for North American Product Development and held an internal consulting position supporting the Globalization of GM Engineering. Currently she is Director, Exterior trim, GMNA and the Global Technical Leader for Wipers, Glass, Sunroofs, and Trim.

Jackson earned a Bachelor of Science Degree in Industrial and Operations Engineering and a Master of Science in Industrial and Operations Engineering from the University of Michigan. She attended Harvard Graduate School and acquired her Master’s in Business Administration Degree.

Having spent 27 years in the plastic automotive industry, with the last 21 years at Advanced Composites NA, Rob Morgan appreciates how change impacts the industry. “There is a constant balancing act to provide customers with the right product for their needs, especially with the rapid changes in technology.

In his role, Morgan leads all commercial activities for Advanced Composites including sales, marketing development and purchasing. During his tenure, Advanced Composites has grown from a small specialty compounding company to one of the largest suppliers on PP compounding products to the NA automotive market. Morgan began his Advanced Composite career leading business development and establishing their first business with the Detroit 3 OEMs. In 2012, Morgan became a global team leader for the Mitsui Chemical network of PP compounding facilities with the express purpose to expand our business relationships with the Detroit 3 to all regions. As a global leader, Morgan interacts with customers and raw material suppliers in China, Thailand, Europe, India, Japan and Brazil.

Prior to joining Advanced Composites, Morgan held several sales/marketing positions at Monsanto Chemical and the General Electric Co. Morgan holds a Bachelor’s degree in Business from the University of Cincinnati.
Heinrich Lingnau
Sr. Vice President/GM Europe, Middle East & Africa
A. Schulman

Driving our Customers’ Success – Next Generation Material Solutions for the Automotive Industry

Lingnau notes, “Today’s global plastics industry customers require innovative solutions to address current market challenges, such as the increasing need for weight reduction, eco-friendliness and paint replacement.” He will share examples of how plastic materials can offer a multitude of solutions to meet current market challenges without compromising the luxurious feel, quality and performance of the final result.

Heinrich Lingnau serves as A. Schulman’s Senior Vice President and General Manager, EMEA, with responsibility for the Company’s operations in the region of Europe, Middle East and Africa. Mr. Lingnau, who has served in this capacity since 2013, joined A. Schulman in 1999 as a regional business leader in engineered plastics before transitioning into various management-level positions within the Company’s European operations. Prior to joining A. Schulman, he spent 11 years at DuPont where his positions included product management and market development for various business units in Europe. Mr. Lingnau received a degree in mechanical engineering with a focus on plastic technology from the University of Aachen/Germany.

Tom Pilette
Global Vice President, Product & Process Development
Magna Exteriors

Past, Present and Future: Focus on Expanding the Use of these Materials, Considering “Car of the Future and Globalization Megatrends”

Tom Pilette was named Global Vice President Product & Process Development of Magna Exteriors (an operating unit of Magna International) in November 2008. As Global Vice President Pilette oversees the expansion and development of exterior core products, processes and materials. Through research, development and innovation initiatives, Pilette is responsible for establishing and maintaining Magna Exteriors’ competitive position in their core markets as well as supporting growth with new customers and in new regions around the world.

Pilette held the previous position of Group General Manager, Modularity Group for Magna Exteriors, formerly Decoma International. Over his career of 20 years at Magna, Pilette has held a number of positions including Director of Sales, Divisional Assistant General Manager and Lead Program Manager for the Exteriors Group.

Throughout his 30 year automotive career, Pilette has gained extensive product development and manufacturing experience focusing in the areas of body structures and energy management systems.
Laurie Harbour will share an in-depth look at the current and future state of the automotive manufacturing industry, including key market trends that are driving complexity into the entire supply chain. Additionally, she will share research findings and insights on plastics industry best practices. Harbour notes that, “the manufacturing industry is changing at a rapid pace, and it is important to view these changes comprehensively, understanding how each piece of the puzzle fits together, to better prepare for the future.

Laurie Harbour is President and CEO of Harbour Results, Inc. and a trusted advisor to the North American manufacturing industry. She monitors, researches and analyzes the manufacturing value stream identifying strengths and weaknesses, gaps and risks, and business and operational opportunities in an effort to help the industry transform to be more successful in the global marketplace.

Prior to joining Harbour Results, Inc., Harbour founded Harbour-Felax Group and was Vice President and company officer at Harbour Consulting. She has vast experience with global automotive manufacturer, tier-one suppliers and the defense industry and provided analysis and counsel in operations improvement, product and process development, competitive research and benchmarking. Additionally, Harbour was responsible for development and management of The Harbour Report, the landmark study of labor efficiency for automotive OEMs.

Harbour earned a BA from the University of Michigan-Dearborn in Operations Management and Human Resources.

Committee Contact Information

Conference Co-Chair / Sponsorship Co-Chair
Dr. Sassan Tarahomi, IAC
phone: +1.248.259.5624
starahomi@auto-tpo.com

Conference Co-Chair / Sponsorship Co-Chair
Technical Program Co-Chair
David Okonski, General Motors Corp.
phone: +1.281.870.6659
dokonski@auto-tpo.com

Technical Program Co-Chair
Dr. Norm Kakarala
phone: +1.248.655.8483
nkakarala@auto-tpo.com

House Chair
Bill Windscheif , AIS Ltd
phone: +1.248.535.2595
bwindscheif@auto-tpo.com

Conference Registration
Karen Rhodes-Parker, SPE
phone: +1.248.244.8993
karen@spedetroit.com
**Monday, October 3, 2016**

7:00 AM  **REGISTRATION & CONTINENTAL BREAKFAST:** Sponsored by Mitsubishi Chemical Performance Polymers

8:30 AM  **WELCOME REMARKS:** Conference Co-Chairperson, Dr. Sassan Tarahomi, IAC Group

8:45 AM  **KEYNOTE:** A Perspective on How TPO is Helping the Automotive Industry Meet Today’s Challenges  
*Betsy Jackson,* Director, Exterior Trim, General Motors N.A.

9:15 AM  **KEYNOTE:** A Compounder’s Perspective: Market Growth, Customer Satisfaction, New Applications/Technology and the Dreaded Raw Material Issues  
*Rob Morgan,* Sr. Vice President, Advanced Composites, N.A.

9:45 AM  **TECHNICAL PROGRAM HIGHLIGHTS:** Norm Kakarala / David Okonski – Lunch Sponsor and Reception Sponsor Remarks

10:00 AM  **BREAK:** Sponsored by International Automotive Components

### Conference Hall-I

**INTERIOR SOFT TRIM: SKINS, FOAMS & COMPONENTS**

- Robert Eller, Robert Eller Associates LLC  
- Dr. Sam He, Inteva Products LLC

- **Trends in Automotive Interiors**  
  *Ken Gassman, Inteva Products LLC*

- **Supply Chain Dynamics and Future Technologies in Auto Interior TPOs and TPEs**  
  *Bob Eller, Robert Eller Associates LLC*

- **Advances in Automotive Door Trim Applications**  
  *Pravin Sitaram, Haartz Corporation*

11:30 AM  **LUNCH:** Sponsored by Sumitomo Chemical

### Conference Hall-II

**LIGHTWEIGHTING POLYOLEFIN PARTS**

- **John Haubert, FCA US LLC**  
- **Normand Miron, Washington Penn Plastics**

- **Effect of Short-Shot and Core-Back Foaming on TPO Performance and Appearance**  
  *Jason Fincher, Advanced Composites*

- **Progress on Formulating and Processing New Light-Weight Automotive Materials**  
  *Russell Goering, Addcomp N.A.*

- **Comparing Current and Emerging Mass Saving Approaches for Polyolefin Resins**  
  *Charles Buehler, LyondellBasell*

2:30 PM  **BREAK:** Sponsored by Formosa Plastics Corporation

### Conference Hall-III

**SURFACE ENHANCEMENTS**

- **Dr. Rose Byntz, IAC Group**  
- **Jeff B. Crist, Ford Motor Co.**
- **Jim Keller, United Paint & Chemicals Corp.**

- **Surface Aesthetics in IM Plastics – The Trifecta of Processing, Material, and Tooling**  
  *Eileen Mc Cotter Gallighugh, IAC Group*

- **Specialized Color Effects Providing Value for Automotive Applications**  
  *Perry Banta, LyondellBasell*

- **Future Market Trends and Technology are Driving Color!**  
  *Nancy Lockhart, Axalta Coating Systems*

3:00 PM  **BREAK:** Sponsored by Formosa Plastics Corporation

### Process Enabling Technologies

**INTERIOR SOFT TRIM: SKINS, FOAMS & COMPONENTS**

- Robert Eller, Robert Eller Associates LLC  
- Dr. Sam He, Inteva Products LLC

- **A Method for Fiber Modification to Improve Filtration Efficiency in Automotive Air Filters**  
  *Xiangu Jin, Yukang Xu, Donghua University*

- **Softell Textile: An Innovative Approach for Automotive Interior Trim**  
  *Sunit Shah, Michael Buedinger, LyondellBasell*

- **PP for Injection Molded Foamed Parts with Excellent Surface Appearance**  
  *Georg Grestenberger, Borealis Polyolefin GmbH*

- **New Soft Foam Structures for Auto Interior Trim with Improved Technical Features and Benefits**  
  *Jesse Baldwin, Toray Plastics (America), Inc.*

4:30 PM  **EVENING RECEPTION:** Sponsored by Advanced Composites North America

**SURFACE ENHANCEMENTS**

- **Dr. Rose Byntz, IAC Group**  
- **Jeff B. Crist, Ford Motor Co.**
- **Jim Keller, United Paint & Chemicals Corp.**

- **Surface Mechanical and Scratch Resistance Characterization of Polyurethane Coatings Under Accelerating Weathering**  
  *Dr. LiPin Sung, NIST (Nat. Inst. StdTech)*

- **The Science Behind ASTM D7869 Accelerated Weathering Protocol**  
  *Mark Nichols, Ford Motor Co.*

- **Discussion of Differences and Correlation Between Accelerated Ageing Test and Natural Weathering Exposure Test**  
  *Susan Zhou, Suzhou Zhourou Chemical Eng. Technology Co., Ltd*

- **Stronger Natural-Filled PP Powered by a New Silane Enables Light Weighting of Structural Automotive Components**  
  *Scott Miller, Dow Corning Corporation*
**Tuesday, October 4, 2016**

**7:30 AM**  **REGISTRATION & CONTINENTAL BREAKFAST:** Sponsored by Mitsubishi Chemical Performance Polymers

**8:00 AM**  **WELCOME REMARKS:** Conference Co-Chairperson, David Okonski, General Motors

**8:15 AM**  **KEYNOTE:** Driving our Customers’ Success – Next Generation Material Solutions for the Automotive Industry
Heinrich Lingnau, Sr. V.P. / G.M. Europe, Middle East & Africa, A. Schulman

**8:45 AM**  **KEYNOTE:** TPO – Past, Present and Future: Focus on Expanding the use of These Materials, Considering “Car of the Future and Globalization Megatrends.” Tom Pilette, Global Vice President Product & Process Development, Magna Exteriors

**9:15 AM**  **Lunch Sponsor and Reception Sponsor Remarks**

**9:30 AM**  **Awards:** Winners of the 2016 TPO Parts Competition, Recognition Awards

**9:45 AM**  **BREAK:** Sponsored by SPE Detroit Section

---

**CONFERENCE HALL- I**

**PROCESS ENABLING TECHNOLOGIES**

- Low-Cost Gas Assisted Processing of Polypropylene+Graphene Nanocomposites
  - **Thomas Ellingham, University of Wisconsin-Madison**

**10:15 AM**  **10:45 AM**

**CONFERENCE HALL-II**

**MODELING FOR PERFORMANCE PREDICTION**

- A Simulation Validation Study – The Influence of TPO Composition on Predicted Part Warpage
  - **David Okonski, GM**
  - **Syed Rehmullah, Autodesk, Inc.**

- Using Mid-Stage Validation to Increase Confidence in Simulation of TPOs
  - **Megan Lobdell, Hubert Lobo**
  - **Datapoint Labs**

**CONFERENCE HALL-III**

**SURFACE ENHANCEMENTS**

- CO2 Cleaning for Surfaces, Pre-Treatment, & Coating Applications: Jon Wikstrom, Cool Clean Technologies

**11:15 AM**  **11:45 AM**

**CONFERENCE HALL- I**

**PROCESS ENABLING TECHNOLOGIES**

- High Volume Aluminum Tooling for Polyolefins – Best Practices and Lessons Learned
  - **Darcy King, John Caccese**
  - **Unique Tool & Gauge Inc.**

**CONFERENCE HALL-II**

- Numerical Prediction of Shape Deviation Due to Welding of Injection Molded TPO Parts
  - **Hui Wang, Li Lu, Jane Zhou**
  - **Ford Motor Company**

- Tiger Striping in a Plastic Injection Molded Part: Experimental and Simulation
  - **Li Qi, Ken Kwasnisk, J. Kloberdanz**
  - **D. Zeng, Ford Motor Company**

**CONFERENCE HALL-III**

- Adhesion to Painted Automotive TPO Parts, Past to Present
  - **Michael Pollock, Phibrochem**

---

**12:15 PM**  **LUNCH:** Sponsored by Washington Penn Plastic Co., Inc.

**12:15 PM**  **1:30 PM**

**RIGID POLYOLEFIN COMPOUNDS**

- A Review of Reinforcement for Polyolefins: Stiffness/ Toughness/ Flow and Other Important Considerations
  - **Michael Balow, Asahi Kasei Plastics North America Inc.**
  - **Ermanno Ruccolo, Mitsui Plastics, Inc.**

- Emissions of Polypropylene Compounds
  - **Dr. Laura Shereda, Asahi Kasei Plastics N.A. Inc.**

**MODELING FOR PERFORMANCE PREDICTION**

- Analytic Prediction of Thickness Change and Residual Stresses on Safety Plastic™ Produced by Thermoforming Process
  - **Hector Hernandez, Ford Motor Co.**

- The Investigation of Fatigue Failure for TPO Materials
  - **Zhengpan Qi, Danielle Zeng, Bhavani Thota, L. Doan, Li Lu, Zuming Su**
  - **Ford Motor Company**

**ADVANCES IN AUTOMOTIVE POLYOLEFINs**

- Advanced UV Stabilization Solutions Enabling TPO to Meet Automotive Needs
  - **Dr. Jian-Yang Cho, Cytec Solvay Group**

- High Performance Stabilization Systems for PP and PP-based TPO Automotive Applications
  - **Heejung Kwon, Songwon Industrial Co., Ltd**

**2:00 PM**  **2:30 PM**

**MODELING FOR PERFORMANCE PREDICTION**

- Weld Strength Prediction for Injection Molded Parts
  - **Jeff Higgins, Doug Kenik, Hanno Van Raalte, Autodesk, Inc.**

- How to Improve Product Quality with the Latest Process Simulation Technology
  - **Anthony Wen-Hsien Yang, Lye Wang, Moldex**

**ADVANCES IN AUTOMOTIVE POLYOLEFINs**

- Superior Weathering Solution for PO Based Automotive Parts using Advanced Hindered Amine Light Stabilizers
  - **Yota Tsuneizumi, ADEKA Corporation.**

- Performance Comparison of Mineral-filled TPOs
  - **Maziyar Bolourchi, IMERSYS**

**3:00 PM**  **3:30 PM**

**CONFERENCE HALL- I**

**PROCESS ENABLING TECHNOLOGIES**

- Comprehensive, In-Process and Full-Cabin Analysis of VOC Emissions
  - **Yan Li, Syft Technologies**

**CONFERENCE HALL-II**

- Comprehensive, High Throughput Analysis of VOC Emissions from Automotive Components
  - **Yan Li, Syft Technologies**

**CONFERENCE HALL-III**

- Primerless Painting of Exterior Parts with Carbon Nanotube Technology
  - **Dr. Marie Hurtgen, Nanocyl SA**

---

**3:00 PM**  **BREAK:** Sponsored by Cimbar Performance Materials
**Tuesday, October 4, 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:00 PM</td>
<td><strong>RIGID POLYOLEFIN COMPOUNDS</strong>&lt;br&gt;<strong>ADHESIVES &amp; COATINGS FOR TPOS</strong>&lt;br&gt;<strong>ADVANCES IN AUTOMOTIVE POLYOLEFINs</strong>&lt;br&gt;Using Hollow Glass Microsphere Master-batches to Optimize Formulations at the Injection Molding Press&lt;br&gt;Stephen Amos, 3M Company&lt;br&gt;Interior Trim Lamination Development&lt;br&gt;Helmut Doyen, Sika Corporation&lt;br&gt;HTPs: A Novel Talc Additive for Smart Polymer Processing&lt;br&gt;Piergiorgio Ercoli Malacari, IMI Fabi SPA</td>
<td>Mike Balow, Asahi Kasei Plastics North America Inc.&lt;br&gt;Ermanno Ruccolo, Mitsui Plastics, Inc.&lt;br&gt;Hoai Pham, Freudenberg Performance Materials&lt;br&gt;Dr. Pravin Sitaram, Haartz Corporation&lt;br&gt;Neil Fuenmayor, LyondellBasell&lt;br&gt;Martha Katz, Ford Motor Company</td>
</tr>
</tbody>
</table>

| 4:30 PM | Opportunities for Lightweight Reinforced Polyolefins Utilizing Mixed Morphology Clays<br>Daniel Berg, BYK USA Inc.| **Advances in Automotive Polyolefins** |
| 5:00 PM | Anisotropic Analysis of Short Fiber Filled PP for Structural Applications<br>Rodrigo Orozco, Asahi Kasei Plastics N.A. Inc.| **Interiors & Soft Trim: Skins, Foams & Components**<br>**Adhesives & Coatings for TPOS**<br>**Sustainability & Biobased Materials** |
| 5:30 PM | Green Materials with Improved Air Quality Inside the Passenger Cars<br>Zhongfu (Jerry) Luo & Dr. Bo Yang, Kingfa Sci. & Tech. (USA) Inc.| **Advances in Automotive Polyolefins** |

| 6:00 PM | **APPETIZER AND STROLL THROUGH EXHIBITOR AREA:** Sponsored by Platinum, Gold and Exhibitor Sponsors |

---

**Wednesday, October 5, 2016**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 AM</td>
<td><strong>REGISTRATION &amp; CONTINENTAL BREAKFAST:</strong> Sponsored by SPE Detroit Section</td>
<td></td>
</tr>
<tr>
<td>8:00 AM</td>
<td><strong>INTRODUCTION OF KEYNOTE SPEAKER:</strong> Conference Co-Chairperson, Dr. Sassan Tarahomi, IAC Group</td>
<td></td>
</tr>
<tr>
<td>8:15 AM</td>
<td><strong>KEYNOTE:</strong> Automotive Manufacturing Forecast: What Does the Future Hold for the Plastics Industry?&lt;br&gt;Laurie Harbour, President &amp; CEO, Harbour Results Inc.</td>
<td></td>
</tr>
<tr>
<td>8:45 AM</td>
<td><strong>BREAK:</strong> Sponsored by SPE Detroit Section</td>
<td></td>
</tr>
</tbody>
</table>
| 9:15 AM | **INTERIOR SOFT TRIM: SKINS, FOAMS & COMPONENTS**<br>New Developments in Chemical Foaming Agents Improve TPO Properties in Injection Molding<br>**Polyolefin Hot Melt Adhesive Technology in Automotive Interior Composites**<br>Sebastien Meliot, Jowat Adhesives<br>Eco-friendly Compounding for Polyolefins<br>Dr. Sam He, Inteva Products LLC | Robert Eller, Robert Eller Associates LLC<br>**ADHESIVES & COATINGS FOR TPOS**<br>Hoa Pham, Freudenberg Performance Materials<br>**Sustainability & Biobased Materials**

| 9:45 AM | Benefits and Challenges for Polypropylene Composites for Automotive Interiors<br>Markus Kralieck, Borealis Polylefin GmbH<br>**Improved Performance for Automotive Textiles Using Surface Modification Technology**<br>Chris Hagler, Gouston Technologies | **Sustainability & Biobased Materials**

| 10:15 AM | **ADHESIVES & COATINGS FOR TPOS**<br>A New Adhesive for Automotive Interior Lamination<br>David Speth, Evans Adhesives<br>Case Studies of Additives’ Impact on Part Performance<br>David Fortener, Inteva Products | **Sustainability & Biobased Materials**

| 10:45 AM | **BREAK:** Sponsored by SPE Detroit Section                                                   |

| 11:00 AM | **INTERIOR SOFT TRIM: SKINS, FOAMS & COMPONENTS**<br>New Halogen-Free Flame Retardant Thermoplastic Elastomer (New HFFR-TPE) for Engine Compartment<br>Ryosuke Kurokawa, Sumitomo Chemical Co. Ltd. | **TPOs for Vehicle NVH Control**<br>**Sustainability & Biobased Materials**

| 11:30 AM | Automotive Interior: Technology Triumphs to Deliver Lighter, Better, Safer<br>**Adding Value to an Injection Molded TPO Front of Dash Barrier**<br>Meagan Marko, Cascade Engineering / Noble Polymers<br>The Use of Micron-size Tire Rubbers as Reinforcement Fillers in the Recycled Thermoplastic Polyolefins<br>Hyunjoo Kim, Entech, Inc. | **Sustainability & Biobased Materials**

| 12:00 PM | **TPOs for Vehicle NVH Control**<br>**Sustainability & Biobased Materials**<br>Why TPOs are the Right Choice of Materials for Automotive NVH Reduction<br>Sassan Tarahomi, IAC Group | **TPOs for Vehicle NVH Control**<br>**Sustainability & Biobased Materials**

| 12:30 PM | **BOXED LUNCH:** Sponsored by Trinseo Automotive                                     | Conference Concludes |
“New Car Smell” Analysis Where You Need It

Rapid, On-line Vehicle Interior Air Quality (VIAQ) Analysis

The Voice200 ultra SIFT-MS from Syft Technologies provides simple, reliable, and economic VIAQ analysis where and when you need it - whether on the production floor or in the parking lot.

- Real-time analysis in parts-per-trillion (ppt) levels
- Aldehydes and VOCs analyzed in one simple analysis
- Simple turnkey operation with pass/fail reporting and configurable thresholds
- Laboratory quality analytical results within seconds enables instant decision making
- Direct air analysis without sample preparation robust and readily deployed to site

Visit www.LQA.com/auto-tpo to learn more about our VIAQ analysis solutions

2016 Sponsors

Society of Plastics Engineers
PUMP UP THE VOLUME
BEYOND THE MAX

LIGHTER WEIGHT IS NOT A TREND.
IT’S A NECESSITY.

With this in mind, don’t miss Norwin van Riel’s presentation of our highly innovative and cost competitive PP-LGF system.

We advance our materials and services focused 100% on your success.

Join us on nowconnect.trinseo.com
In the chase to meet today’s automotive challenges, you need lightweight materials to drive change. Technologies to remove barriers. And global support to get you where you want to go.

Tap into our application development expertise, technology leadership and broad portfolio of materials, and let’s change the automobile for the better...together.
As the auto industry’s go-to source for specialty and engineering thermoplastic resins, Chase Plastics delivers expertise on material selection, part and tool design, and processing support. Combined with a global supply base, we put you in control of your success.

Visit chaseplastics.com Today
Let’s kick around some ideas.

When you combine our patented materials with our constantly evolving proprietary stitching techniques, you can achieve any goal. Feel free to give us a call. At Inteva, we collaborate with engineers and designers from every major vehicle manufacturer to create new materials that score with buyers all around the globe. Leave Your Mark.

intevaproducts.com  248.655.8886
BENCHMARK PERFORMANCE

LyondellBasell sets the bar in the industry that demands excellence!

- Innovative low density TPOs for light-weighting
- Optimum processability for foaming or thin-walling
- Superior aesthetics and outstanding scratch resistance
- Low emission for stringent air quality requirements

Visit our booth and learn how we can set the benchmark together!

lyondellbasell

lyb.com

For over 50 years, Borealis and Borouge have been leading suppliers of advanced polyolefin plastics for engineering applications in the automotive industry. Thanks to our unique and proprietary Borstar® technology, we provide a large portfolio of innovative products and services that create real value for customers and partners around the world. Innovative automotive solutions include materials for exterior, interior and under the bonnet applications, such as bumpers, body panels, trims, dashboard, door cladding, climate control units, air intake manifolds as well as battery cases.

Borealis and Borouge know that moving forward is what the automotive industry is all about. This is why we offer advanced plastic solutions to support your future needs. Our innovations help to reduce vehicle weight for optimal performance. Global expansion of production and compounding capabilities ensures a reliable material supply. And finally, local on ground support is readily available thanks to a worldwide network of dedicated experts.

borealisdrivingtomorrow.com
borealisgroup.com
borouge.com
Trends in Automotive Interiors

Kenneth Gassman
Inteva Products LLC

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 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.

Supply Chain Dynamics and Future Technologies in Auto Interior TPOs and TPEs

Robert Eller
Robert Eller Associates LLC

This talk we will examine the forces driving material substitution and process evolution in auto interiors. In particular, the competition between TPO and other TPEs especially styrene block copolymers (SBCs) and thermoplastic vulcanizates (TPVs) will be examined. In addition to the well-known driving forces (lightweighting, scratch/mar protection, cost savings, etc), the future prospects for process consolidation, parts integration, foaming and the innovation process will be examined.

Advances in Automotive Door Trim Applications

Pravin Sitaram
The Haartz Corporation

Automotive Interiors is a constantly evolving field in terms of material development. Softness creates an inherent feeling of luxury, and with OEMs aiming to increase this image in all vehicle levels, the material function is being challenged to meet opposing objectives…soft yet dent resistant. The Haartz Corporation has engineered a range of new door trim soft TPO laminates based on the relationship between the foil and foam layers to resist indentation and improve recovery.

Investigation into Dent Recovery Performance of TPE Skins

Kevin Lyons
Inteva Products LLC

The indentation recovery of skins is an important property for interior applications. This paper will investigate the factors that affect the dent recovery performance of TPE bilaminate skins. Physical and mechanical properties will be reported and discussed in conjunction with laminate structure and manufacturing considerations. The paper will also attempt to develop a more efficient test method based on creep/recovery tests and correlate the results to standard indentation test method results (VDA 237-101) and resin properties.
Innovative Automotive Solutions with New Kraton Polymer Technologies

Dr. Marcus Greger
Kraton Polymers LLC

Kraton Polymers has developed new polymer systems that address the needs of interior and exterior applications in the automotive market. This discussion will introduce how newest Kraton® polymers will address light weighting in automotive interiors, improved long term aging performance of soft skin applications, cost effectively expanding the use of soft skins in interior applications and use of Kraton® technologies in TPO/PP systems to enhance performance properties of these systems.

Performance Driven Flexible Olefinic Materials

Dr. Charlie Yang
LyondellBasell

Flexible olefinic materials demonstrate many benefits for instrument panel and door panel cover layers, including soft touch, grain formation, low density, low VOC, and excellent recyclability. They also provide flexibility, easy processability and other functional requirements for exterior applications which demand excellent low temperature impact at reasonable cost. A background of these materials is presented, followed by a focus on unique LyondellBasell technologies which expand flexible olefinic material performance levels as demonstrated by successful applications.

A Method for Fiber Modification to Improve Filtration Efficiency in Automotive Air Filters

Yukang Xu*, Shang Zhu, Chen Huang, Xiangyu Jin*
Donghua University, Shanghai, China

Higher filtration efficiency in automotive air filters is very desirable for occupant healthy and better engine performance. In this article, triboelectrification effect and filtration efficiency of various filters made of mixed fibers, namely the mixture of PTFE-PP, are investigated. According to the results, it is found that both triboelectrification and filtration efficiency in filters containing inorganic-powder-modified PTFE split fibers are more significant (approximately 10%-20%) than that in filters with general fibers.

Softell Textile: An Innovative Approach for Automotive Interior Trim

Sunit Shah*, Neil Fuenmayor, Michael Buedinger, Martin Lux
LyondellBasell

In addition to weight and cost savings, surface aesthetics, durability and color harmony continue to be key drivers for automotive interiors. This paper introduces Softell Textile, an innovative material technology for upper interior trim applications that enable the use of a single substrate to provide the aesthetics, haptics, and performance of a textile fabric-wrapped substrate. Also reviewed will be comparisons and advantages of Softell Textile to traditional approaches used for automotive interior trim.
Polypropylenes for Injection Moulded, Foamed Parts with Excellent Surface Appearance

Georg Grestenberger*, Susanne Kahlen, Daniela Mileva, Michael Jerabek
Borealis Polyolefin GmbH

In this work a polypropylene compound was developed that can be processed into foamed automotive parts with excellent surface appearance and mechanical properties. As there are no standardized methods available to describe the properties of foamed parts, one part of this study focused on the development of test standards including a unique foaming mold. These tools were used to systematically investigate the fundamentals of foaming and tailor materials that meets stringent OEM requirements when foamed.

New Soft Foam Structures for Automotive Interior Trim with Improved Technical Features and Benefits

Jesse Baldwin*, Paul Sieradzki
Toray Plastics

After launching the second generation of ToraSoft®, Toray continues to be innovative in developing foam structures that bring new features and benefits not previously attained with TPO/foam bilaminates. These features include very specific foam skin layers with engineered properties for improved TPO & chemical compatibility, adhesion, and strength. Additionally, this technology improves the sustainability effort of using TPO/foam bilaminates for interior trim. Toray will present some of their new foam developments detailing these concepts.

New Developments in Chemical Foaming Agents Improve TPO Properties in Injection Molded Foaming Applications

Peter Schroeck*, Randy Minton
Reedy Chemical Foam
Michael Hayden
Asahi Kasei Plastics
North America

The author will present data on how a new generation of chemical foam agent technology in conjunction with next generation TPO technology improves the physical and appearance properties while reducing the mass of injection molded foamed TPO applications. Particular attention will be discussed on how the synergistic benefit of the next generation technologies accomplish this property improvement.

Benefits and Challenges for Polypropylene Composites for Automotive Interiors

Markus Kralicek
Borealis Polyolefin AG

Borealis, a leading supplier of innovative polyolefin plastic materials for engineering applications in the automotive industry, will present its latest polypropylene innovation in the area of composite application technology. In cooperation with leading Tier 1 suppliers, Borealis has introduced portfolio of PP solutions for composite sheets/tapes and high performance fibre reinforced compounds for over molding. Based on the experience from number of pilot projects, this presentation will demonstrate the potential benefits and challenges for polypropylene composites inside automotive.
A New PP Based Composite Melt-Blown Superfine Fiber Filter for Automobile Air Conditioning System

Zijian Dai*, Xiangyu Jin, Qinfei Ke, Donghua University, Shanghai, China

Automotive air conditioning filters are the most widely used in conventional air conditioning system today. However, single function, short saturated absorption time and difficult treatment of abandoned adsorbent make them less effective. A multifunctional composite filter combined polypropylene-based melt-blown felt and activated carbon fibers were designed with MnO2 nanoparticles and corona discharge technology in the melt-blown superfine fibers. The new filter possessed abilities of filtration, absorption and catalysis simultaneously.

New Halogen-Free Flame Retardant TPEs

Ryosuke Kurokawa
Sumitomo Chemical Co., Ltd.

New halogen free flame retardant thermoplastic elastomers (HFFR-TPEs) with UL-94 flammability rating equivalent to V-0 and oxygen index over 30 percent were developed. The HFFR-TPEs have excellent flame retardancy while exhibiting significantly lower toxic gas compared to similar halogen flame retardant material. It is easier to mold and can be used for a wide range of applications such as wire covering materials, electronic parts, architecture gasket, etc.

Automotive Interior: Technology Triumphs to Deliver Lighter, Better, Safer

Sameer Mehta*, Junjun Li
Asahi Kasei Plastics North America

Automotive engineers and designers have been challenged for years to constantly deliver improvements in automotive applications without compromising fit, form and function. Some innovations are driven by consumer expectations, while some are defined by market imposed needs, including safety, regulatory and performance. The myriad design needs are often in conflict with performance limitations of existing technology. The paper will talk about current design challenges and material innovations to enable lighter, better, safer automotive applications.

The Property Study on Needle-Punched Automotive Carpets Made from Recycled Polyester Fibers

Yuxiao Wang*, Dan Wang, Lei Zhang, Jing Li, Xiangyu Jin
Donghua University, Shanghai, China

The new fibers were made from recycled polyester fabrics by melt spinning. The property of various recycled polyester fibers were analyzed for crystallinity, molecular weight, melt viscosity and density. The basic properties of recycled fabric polyester staple fibers are compared to the ordinary polyester fibers. The X-ray diffraction result shows that the variation of crystallinity and orientation. The needle-punched carpets made from recycled polyester fabrics have excellent abrasion resistance and flame retardant property.
POWERFUL PELLETS DELIVER ADVANCED ANTI-SCRATCH SOLUTIONS FOR INTERIORS

Maintain the perceived value of smart-looking automotive interiors. Improve scratch and mar resistance of polymers like PP and other TPOs with Siloxane Masterbatch technology from Dow Corning.

Easy-to-use pellet additives with surface-stable silicone can lock in long-lasting advanced anti-scratch performance.

Visit us at Booth 9 to learn more.

dowcorning.com/sampleSiMB

Driving new levels of performance and innovation

Braskem creates solutions for the automotive industry by collaborating with industry leaders to accelerate next generation technologies. These technologies help the industry achieve and surpass their light weighting goals.

We make chemicals and plastics to help make people’s lives better.

Visit us at booth 26
These words haven’t always played nice. Today they do.
Our thread design data is ready for download. Let’s design some screw bosses together.  
http://bit.ly/1AZpkb0

Mitsui Plastics, Inc. provides a full range of global solutions for the Automotive and Plastics Industries.

PRODUCTS
• PP & PP Compounds
• TPO Products
• Engineering Plastics
• Metallic Film Laminates
• Polymer Additives
• Color Concentrate & Master Batch Products

SERVICES
• Supply Chain Management
• Environmental Support
• Global Logistical Support

Mitsui Plastics, Inc. Your First Choice for Innovative Automotive Solutions
www.mitsuiplastics.com
Effect of Short-Shot and Core-Back Foaming on TPO Performance and Appearance

Jason Fincher
Advanced Composites

Weight reduction continues to be an emphasis for automotive TPO compounds. One method for reducing weight is short-shot foaming where chemical foaming agent is utilized to assist filling and packing the tool. This work considers weight reduction and mechanical property changes that arise from short-shot and core-back foaming. Additionally, the potential benefits of TPO compounds designed specifically for injection foaming are addressed.

Progress on Formulating and Processing New Light-Weight Automotive Materials

Russell Goering*, Louis Martin
Addcomp North America

Lightweighting is tremendously important to the automotive community due to fuel efficiency and reduced environmental impact needs. One of the most promising lightweighting technologies in plastic composite materials is the addition of glass bubbles. This technology offers uniformity of distribution, reduced processing sensitivity, and a potential for good retention of physical properties. Unique formulations, modified feeding strategies, and different screw designs improve the ability of processors to make light-weight polyolefins and polyolefin composites using glass bubbles.

Comparing Current and Emerging Mass Saving Approaches for Polyolefin Resins

Charles Buehler*, Neil Fuenmayor, Dr. Dieter Langenfelder
LyondellBasell

Lightweighting of vehicle components is a key global approach used to assist meeting fuel efficiencies and CO2 emission mandates. With polyolefins, lower density innovations and part wall thickness reduction have allowed for successful mass savings. Physical Foaming (PF) and Chemical Foaming (CFA) technologies are also being employed. This paper will discuss these mass savings methods as well as benefits and concerns of each for effective decision making. Material development criteria to optimize performances will be explored.

Fibremod Carbon – An Economic Light Weight Solution for the Automotive Industry

Michael Tranninger*, Jerabek Michael, Gennaro Signorelli
Borealis Polyolefin GmbH

Borealis, a leading provider of innovative solutions developed based on its Fibremod™ technology revolutionary carbon fibre reinforced polypropylene grades. Borealis’ leading-edge Fibremod™ technology portfolio is now enlarged by Fibremod™ Carbon, a carbon fibre reinforced polypropylene. This innovative engineering Fibremod™ Carbon portfolio will help the automotive industry to reap the benefits of carbon fibre reinforced plastics such as outstanding density to weight ratio allowing significant weight reduction and increased functionalization and modularization of components.
Research of Carbon Fiber Non-Woven Fabric Reinforced Thermoplastics Composites Through Press Molding

Masaya Matsushita*, Yoichiro Ogura, Akihiko Imajo, Hiroyuki Hamada Yuho Toyobo

The carbon fiber non-woven fabric which could omit the process to impregnate matrix resin to carbon fiber and could mold by a short process only for press molding was paid attention. In this research, it was examined the influence of the molding conditions on the mechanical properties during the heat press molding. Moreover, during the cold press molding, it was examined the spring-back phenomenon rate on heating process and the mechanical properties.

Empowering Light Weight Innovation through Advanced LGF Concentrate Technology

Norwin van Riel
Trinseo

Trinseo automotive will introduce an advanced high glass content LGF PP concentrate which can be diluted with tailor-made Trinseo neat PP resins. This LGF PP system approach provides a very cost efficient, easy processable and high quality solution for multiple semi structural interior components. A successful validation case study will be shared.
2016 Sponsors

Society of Plastics Engineers

**CLARIANT**

**Coloring & Protecting Plastics**
**FOR ANYTHING ON WHEELS**

WWW.CLARIANT.COM/MASTERBATCHES

---

**Global Solutions Provider**

PP  HDPE  SAP  ABS  LLDPE

EVA  Plasticizers  PC/ABS  PC

PVC  LDPE  Carbon Fiber

PU & PVC Synthetic Leather  POM
ExxonMobil Chemical believes mobility is more than just a luxury
and that it’s essential for life. It’s why we work closely with the
global automotive industry to help them make lighter, stronger
cars that are safe, sustainable and affordable for everyone.

Our extensive portfolio of ExxonMobil™ impact copolymer (ICP)
polypropylene (PP) resins enable advanced vehicle designs that
offer greater fuel-efficient performance. They’re another
example of our long-term commitment to providing the industry
with compounding solutions for today — and tomorrow.

Capture the benefits of lightweight part performance now.

Contact Bob Poulter to meet at TPO Conference 2015
(robert.r.poulter@exxonmobil.com) or
visit exxonmobilchemical.com/pp.

ExxonMobil™ ICP polypropylene
Surface Aesthetics in IM Plastics – The Trifecta Result of Processing, Material, and Tooling

**Eileen McCotter Gallihugh**  
IAC Group

Automotive part appearance defects in Injection Molding lead to scrap, decreased equipment efficiencies, product rejections, and costly downtime throughout the industry. These challenges can be amplified when utilizing TPO materials without the right information for design and processing. This session shows examples of various surface defects in injection molded TPO such as ghosting, tiger striping, streaking, blushing, and splay. The root causes of these surface defects will be explored along with potential solutions including changes in processing, equipment, and material selection.

Specialized Color Effects Providing Value for Automotive Applications

**Perry Banta*, Neil Fuenmayor**  
LyondellBasell

Molded-in-color thermoplastic polyolefins (TPOs) with specialized color effects such as metallic appearance have been used in the auto industry for many years. LyondellBasell has developed many technical advances that provide value to the automotive community via secondary step elimination and complexity reduction, delivering beneficial weight reduction, while offering OEMs visual effect enhancement and styling flexibility for their product line. Current commercial successes and exciting new options available for future enhancements will be reviewed.

Future Market Trends and Technology are Driving Color!

**Nancy Lockhart**  
Axalta Coating Systems

Over the past 10 years, the market has been heavily populated with neutral color spaces that have complimented the global automotive market. Color science and technology are pushing color to more chromatic and interesting color spaces. Will the automotive landscape look more brilliant in the future? Stay informed as Nancy reviews the color development cycle, upcoming automotive trends and market influences. A look back at historical colors and the future trends will showcase this journey of automotive color technology.

Improve Sunscreen Resistance of Automotive Interior Soft Feel Coatings

**Jianhui (Joe) Zhou**  
Eastman Chemical Co.

Soft feel coatings are commonly applied to many plastic parts to improve comfort and aesthetic value. A critical unmet need for this application is sunscreen resistance. This work introduced a TMCD glycol (2,2,4,4-tetramethyl-1,3-cyclobutanediol) based polyester polyol into a typical soft feel coating formulation. The development focus is to increase stain and chemical resistance, including sunscreen resistance, while maintaining its soft touch feeling. Substrates used for the testing include flexible PVC sheets and rigid substrates such as PC/ABS etc.
There is More to Scratch Resistance than Scratch

Suresh Swaminathan*, Adam Maltby
Croda

The drive to use plastics in automotive applications is increasing. Plastics intrinsically have poor scratch resistance than the materials they replace. This presentation discusses how slip additives can be used to boost scratch performance and why there is more to assessing and improving scratch resistance than simply measuring scratch visibility. Croda will demonstrate how different additives migrate, their effects on visible bloom and how the stability impacts on organoleptics and color properties.

Quantitative Evaluation of Scratch Performance of Soft Polymers Using the ASTM/ISO Scratch Test

Shuang Xiao*, Hung-Jue Sue
Texas A&M University

The scratch behavior of a series of model soft polymers (cast polyurethane elastomers) is investigated according to the ASTM D7027/ISO 19252 scratch test methodology. It is found that the ASTM/ISO standard scratch test can be used to quantitatively differentiate the scratch performance of soft polymers. These model systems exhibit entirely different deformation and damage phenomena, which are found to correlate well with coefficient of friction, quasi-static tensile true stress-strain as well as dynamic mechanical behavior.

Surface Mechanical and Scratch Resistance Characterization of Polyurethane Coatings under Accelerating Weathering

Dr. LiPiin Sung*, Ching-Hsuan Chang, Yu-Lun Cheng
NIST

Current test methods for monitoring performance of protective coatings focus on chemical properties, optical properties such as color and gloss measurements, or invasive tests such as abrasion, cross cut adhesion. In this presentation, a scientifically-based performance protocol using indentation methodology for characterization and quantification of surface performance properties will be demonstrated via two different case studies.

The Science Behind ASTM D7869 Accelerated Weathering Protocol

Mark Nichols
Ford Motor Company

A recently developed accelerated weathering protocol, ASTM D7869, provides significantly improved correlation between accelerated weathering and natural weathering in south Florida. The improved trustworthiness of the protocol is due to a high fidelity match between sunlight and the output of the light source in the weathering chamber. In addition, the water cycles in the new protocol allow the samples to approach saturation, as those samples do during nightly dew events in south Florida. In addition to superior accuracy, ASTM D7869 is 40% faster than SAE J2527.
Discussion of Differences and Correlation Between Accelerated Weathering Ageing Test and Natural Weathering Exposure Test

Susan Zhou
Suzhou Zhourbo Chemical Engineering Technology Co., Ltd, China

Automotive weathering performance over lifetime is important. During whole lifetime, vehicles will be experiencing different weather conditions. Based upon OEM’s specifications, there are two designed weathering stability tests: accelerated weathering ageing test (short term test) and natural weathering exposure test (long term test). This paper analyzes the real testing data to show the difference of two testing methods, and to discuss the correlation between the short term test and long term testing methods.

Stronger Natural-Filled PP Powered by a New Silane Enables Lightweighting of Structural Automotive Components

Scott Miller
Dow Corning Corporation

New technology has been developed that significantly improves the performance of polypropylene (PP) natural fiber composites. This breakthrough allows for improved natural fiber PP composites, including the grafting of reactive silane to the PP chains, while minimizing polymer degradation, and increasing mechanical & long term aging performance to reach that of glass fibers reinforced PP. The presentation will show a comparison with MAgPP and glass fibers, including part density reduction and improvements in mechanical performance and long-term aging under various fluids and conditions.

CO₂ Cleaning for Surfaces, Pre-Treatment, & Coating Applications

Jon Wikstrom
Cool Clean Technologies

CO₂ cleaning for surface technology covers industrial surface treatment and finishing – cleaning and pretreatment to coatings and finishes. Automated CO₂ spray technologies have been used to meet a wide range of cleaning and surface preparation applications. CO₂ cleaning offers benefits of particle and residue removal in a non-condensing spray. This paper summarizes the technology, how it has been applied to cleaning of automotive parts, O&M cost factors, and explains advantages over traditional cleaning technologies.

Adhesion to Painted Automotive Exterior TPO Parts, Past to Present

Michael Pollock
PhibroChem

The automotive industry has been closely linked to the plastics industry and has helped drive much technical advancement. One plastic of profound interest for exterior parts is Thermo Plastic Olefin (TPO). The need for decorating has also driven suppliers to find technology to achieve better coating performance. This paper presents why adhesion promoter modified polyolefin resins remain the most robust choice in providing the balance of adhesion, ease of application and performance needed in the automotive industry today.
Primerless Painting of Exterior Parts with Carbon Nanotube Technology

Dr. Marie Hurtgen*,
Alicia Rul,
Michael Claes
Nanocy SA

Electrostatic painting is commonly used in the automotive industry to reduce paint usage. The grounding of the part to be painted (e.g. bumper) is generally ensured by a conductive primer. A cost effective alternative consists in using an electrically conductive carbon nanotubes-containing plastic, allowing the suppression of the conductive primer and the reduction of VOC emissions. This paper shows the primerless painting of CNT-reinforced TPO and ABS/PC for exterior parts with high paint transfer efficiency.

A New Long-Glass-Fiber-Reinforced Polypropylene with Improved Surface Appearance

Koichi Saito*,
Hiroki Sano,
Japan Polypropylene Corporation
Richard Tuttle
COMUSA Inc.

Long-glass-fiber-reinforced polypropylene (LGF-PP) has replaced metal or GMT as substrate material of automobile module parts because of its excellent rigidity and impact resistance. In this presentation, LGF-PP “Funcster” will be introduced with good physical and aesthetic quality. This aesthetic quality open the window for an interior parts application.

GO FARTHER ON LESS WITH PLASTICS.

New Roadmap Available
Download free at www.plastics-car.com
Prepare TPO Surfaces with Openair® Plasma

- **Intelligent Automation:** Surface treatment at your line speeds. Full and fool proof process control built into every system. Clean, simple integration into your line.
- **Low Surface Energy:** TPO, PE, PP and other materials functionalized for bonding, painting, or coating without negative HazMat, stack emission, or work environment impact.
- **The Global Leader:** Maximum productivity and uptime. We work when and where you work with global support of the industrialized world. UL, CSA, CE approved.

Elgin, IL • Ancaster, ON • Belmont, CA
Phone: (855) 4TH-STATE or (847) 783-0622
infooptna@plasmatreat.com
www.plasmatreat.com

Global Markets Just a Call Away
Design-Manufacture Deliver Global

www.UnitedPaint.com
248-353-3035

RELIABLE ANALYSIS INC

Reliable Analysis provides chemical, electrical, material and product testing and engineering services to manufacturers in the aerospace, appliance, automotive, electronics, furniture, metals, and plastics industries.

www.ralab.com

TECHMER PM

MASTERBATCH SOLUTIONS FOR AUTOMOTIVE

Techmer PM’s automotive solutions address key challenges facing the automotive industry such as higher fuel economy standards, the need for cost reduction, greater durability requirements, and an ever increasing focus on sustainability.

- **Weight Reduction**
- **Heat & Light Management**
- **Scratch and Mar Resistance**
- **Special Effect and Metallic Colors**
- **Anti-Counterfeit and Laser Marking**

Learn More: TechmerPM.com/TPO
LEADING THE WAY WITH ENGAGE™ POE SOLUTIONS FOR AUTOMOTIVE TPOs

With technical experts and decades of thermoplastic olefins expertise, Dow delivers best-in-class polyolefin elastomer solutions that customers demand. This includes solutions for hard and softer TPO applications in automotive interior and exterior systems that enable impact resistance, enhanced aesthetics, lightweighting, and much more. Find out how Dow is helping to drive the future of transportation at www.dow.com/auto-tpo.

VISIT US AT BOOTH 11 TO LEARN MORE.

COLOR & ADDITIVE MASTERBATCHES FOR AUTOMOTIVE APPLICATIONS

- nCore® Chemical Blowing Agent
- Lightweighting Technology
- Global Launch Support
- Special Effects and Exterior Paint Replacement Technology
- Thousands of OEM Color Approvals

© Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

VISIT US AT BOOTH 11 TO LEARN MORE.
Use of Core Retraction to Achieve Low Density Foams in Microcellular Injection Molded Polypropylene Parts

**Thomas Ellingham**, **Hrishikesh Kharbas**, **Lih-Sheng Turng**
UW-Madison

Core retraction was used with the MIM process to foam thick polypropylene (PP) parts with high density reductions of 30% and 55%. The lowest densities were achieved with a core retraction-aided microcellular injection molding (CR-MIM) process, the results of which could not have been achieved by the conventional MIM process alone. The effects of delay time and weight reduction on the microstructure of the core and skin layer were investigated. Use of core retraction also yielded more consistent densities and tensile properties at different distances from the gate location.

Weight Reduction of Plastic Components by Using Modern Technologies That Allow for Optimizing Part Performance

**Dr. Juergen Giesow**
ARBURG

With the continued focus on the increased cost of energy there is an excellent opportunity to increase energy efficiency through weight reduction of injection molded components. 'Light weighting' of parts while maintaining, or even improving, their performance in their respective application fields, such as automotive and aerospace fuel efficiency, is now a focal point in the injection molding industry.

Analysis of the Foam Injection Molding Process Using a Chemical Blowing Agent

**Syed Rehmathullah**, **Sejin Han**, **Franco Costa**, **Edwin Klompen**
Autodesk, Inc.

This paper details the analysis of the foam injection molding process which uses a foaming gas generated from a chemical blowing agent. The analysis is done using a numerical simulation program developed in this study. The simulation analyzes the injection molding process with the calculation of bubble nucleation and growth. Experiments were conducted to validate the simulation results. The experiments performed include viscosity measurement and molding experiments. The experimental and simulation results compare reasonably well.

Foamcore Blow Molded Structural Components for Automotive Applications

**Steven Sopher**
JSP Corporation

JSP has developed and optimized a blow molding process that combines traditional blow molding with an injection molded particle foam core. This process, called Foamcore, utilizes traditional blow molding equipment combined with a particle foam injection unit to produce a composite blow molded part with a solid foam core. JSP’s Foamcore technology allows for simpler designs, higher strength to weight ratios, lower part weight, all while using existing tooling with minor modifications.
Low-cost Gas Assisted Processing of Polypropylene+Graphene Nanocomposites

Thomas Ellingham
UW-Madison

Polypropylene (PP) and graphene nanoparticles (GNPs) were mixed in a twin-screw extruder equipped with a CO₂ injection unit to produce nanocomposites with a 0.5% by weight loading. The addition of CO₂ into the melt allowed for foaming to occur within the barrel of the extruder and upon die exit. Samples processed with CO₂ showed increased exfoliation and dispersion. This low-cost gas assisted processing (LGAP) method is introduced as an alternative to supercritical fluid assisted extrusion.

High Volume Aluminum Tooling for Polyolefins - Best Practices and Lessons Learned

John Caccese*, Darcy King
Unique Tool & Gauge Inc.

For many, although not all automotive applications where rigid polyolefins are utilized, aluminum tooling for higher volume production runs offers the potential for operation on reduced clamp tonnage molding machines, along with dramatic cycle time reductions of up to 50% or more versus traditional P-20 steel. This presentation discusses applications where aluminum tooling works best, typical development times versus steel tooling, best practices and lessons learned over the course of several years of production usage.

Techniques and Options for Improved Twin-screw Compounding of Reinforced Polyolefins

Paul Andersen
Coperion Corporation

Application requirements for polyolefin compounds continue to push the performance envelope with respect to improved mechanical properties, aesthetic properties, processing characteristics and as always, cost. In order to attain required properties compound formulations can be very complex, but invariably will require fiber reinforcement and/or mineral filler. This paper will review basic requirements for compounding reinforced polyolefins as well highlight recent innovations in Co-rotating Twin-screw technology that have enhanced product quality and productivity for these materials.

How to Optimize Compression Molding Process Parameters with Simulation Tools

Adam Miller*, Joe Wang, C-W.Wang, W.C.Tsai, S-B.Sun, C-H.Hsu
Moldex3d

In this fast changing world, quality of the product as well as time to market are among many factors crucial in optimizing profits. Traditional trial and error method is time consuming and cost wasting. Having a successful simulation is the key to solving the above mentioned issues. However, one aspect that is often ignored in simulation is the accuracy of material properties. Herein, we will carry out a novel viscosity characterization method for composite material systems, and use them in the subsequent compression molding simulation in order to find out the optimal processing conditions.
A Simulation Validation Study –
The Influence of TPO Composition
on Predicted Part Warpage

David Okonski*,
General Motors
Syed Rehmathullah
Autodesk, Inc.

The use of thermoplastic polyolefins (TPOs) in the automotive industry is extensive and growing. This study begins with an investigation of the influence of TPO composition on as-molded part warp through experimental moldings of several TPO blends of varied composition. Furthermore, a validation study of the predicted part deflection will be done using Autodesk Moldflow injection molding simulation software; results to provide insight as to mesh-type and any considerations needed when characterizing TPO materials.

Using Mid-stage Validation to
Increase Confidence in Simulation
of TPOs

Hubert Lobo*,
Megan Lobdell
Datapoint Labs Technical Center for Materials

Finite element analysis of plastics contains assumptions and uncertainties that can affect simulation accuracy. It is useful to quantify these effects prior to using simulation for real-life applications. In one study, a quasi-static three-point bending experiment of a standardized parallel ribbed plate is performed and simulated, using Abaqus. In a second study, a dynamic dart impact experiment is validated using LS-DYNA.

Numerical Prediction of Shape Deviation Due to Welding of Injection Molded TPO Parts

Li Lu*, Jane Zhou, Hui Wang
Ford Motor Company

This paper presents a general CAE simulation methodology to simulate welding process and to predict the warpage and shape deviation from nominal in finished automotive plastic component. A case study was conducted on TPO (thermoplastic polyolefin) automotive glove box bin and door sub-assembly, which are joined using Infra-Red (IR) or vibration welding process.

Tiger Striping in a Plastic Injection Molded Part: Experimental and Simulation

Adam Miller*,
Anthony Yang,
Jye Wang,
Moldex3D
Li Qi, Ken Kwasnik,
Li Lu,
Jeffrey Kloberdanz,
Danielle Zeng
Ford Motor Company

Tiger stripes are critical defects for injection molded parts, especially for unpainted appearance applications. In this work, Moldex3D’s flow solver, considering polymeric viscoelasticity, is used to simulate the tiger stripe phenomena on a spiral shaped part. A Design of Experiment (DOE) is conducted to study the factors contributing to the tiger stripe effect. Simulation results show a strong correlation between the flow-induced stress distribution and the tiger striping observed in the experiment.
Analytic Prediction of Thickness Change and Residual Stresses on Safety Plastic™ Produced by Thermoforming Process

Hector Hernandez  
Ford Motor Company

This paper presents methodologies for using LS DYNA (non-linear finite element solver) to model the thermoforming process on Safety Plastic® cones (countermeasure for absorbing energy under Interior Head Impact FMVSS201u). Due to the nature of the thermoformed TPO parts the virgin material sheets suffer thickness reduction and residual stresses generated during the manufacturing process, the present paper shows the methodology to predict the final thickness distribution and residual stresses by a CAE simulation.

The Investigation of Fatigue Failure for TPO Materials

Zhengpan Qi*, Danielle Zeng, Bhavani Thota, Linh Doan, Li Lu, Zuming Su  
Ford Motor Company

Thermoplastic polyolefin (TPOs) are widely used in automobile industry applications. The mechanical properties of TPOs are temperature and strain-rate dependent. In this paper, the material failure mechanism under cyclic loadings is investigated. A critical frequency-load map is proposed to identify the failure modes. To reduce experimental effort, a modified viscoplasticity model is proposed to calculate the energy dissipate and temperature increase during fatigue testing to predict such critical frequency-load map.

Weld Strength Prediction for Injection Molded Part

Jeff Higgins*, Doug Kenik, Hanno Van Raalte  
Autodesk, Inc.

This presentation will review weld lines, their causes and the risk they introduce into plastic parts. An overview of the theory and validation of the simulation approach will be given. Finally, we will demonstrate a practical workflow on how to use Autodesk Moldflow Insight and Helius PFA software to predict the weld line strength of injection molded parts.

How to Improve Product Quality with the Latest Process Simulation Technology

Adam Miller*, Joe Wang, Chen-Chieh Wang, Shih-Po Sun, Hsien-Sen Chiu, Jimmy C. Chien, Anthony Wen-Hsien Yang  
Moldex3d

We will show how the latest simulation helps resolve critical product quality issues, including dimensional or appearance problems. While part design and manufacturing are becoming more challenging, process and simulation tools are also improving. Through better understanding of complex material flow to the dynamic control of tool temperature, the gap between reality and simulation is being steadily bridged. We will learn how incorporating the viscoelasticity properties of polymer melt could improve the simulation of appearance and dimensional accuracy.
Better Adhesives for Great Looking Vehicles

H.B. Fuller is connecting what matters in the complex automotive interior trim assembly process. We help our customers drive manufacturing efficiencies. We enable them to meet their sustainability goals. And, we deliver world-class adhesive solutions that respond to ever-changing consumer demands. We make it our business to know your industry and processes inside out, and bring in-depth knowledge to help solve the specific adhesion challenges you face.

Learn more at www.hbfuller.com/automotive.
DatapointLabs
Technical Center for Materials

Data for Simulation in 5 days

TestPaks® include material testing, data fitting, and CAE material files, direct-deposited to your Matereality® database.

Use Matereality software to create input files for supported CAE codes, and selectively share data with colleagues and partners.

Get the right data, in the right formats, for your CAE

Material Suppliers:
Order a single Multi-CAE TestPak and receive input files for all supported Crash, Injection Molding, or Structural simulations.

strengthening the materials core of manufacturing enterprises

datapointlabs.com | testpaks.com | matereality.com | picsci.com | knowmats.com

MODERN DISPERSIONS, INC.
Thermoplastics Compounding

- Black Concentrates
- Additive & Specialty Concentrates
- Conductive & Static Dissipative Compounds
- Toll & Proprietary Compounds

MODERN DISPERSIONS, INC. • 978-534-3370
78 MARGUERITE AVENUE • LEOMINSTER, MA 01453-4227
WWW.MODERNDISPERSIONS.COM
A Review of Reinforcement for Polyolefins: Stiffness/Toughness/Flow and other Important Considerations

Michael Balow
Asahi Kasei Plastics
North America

This presentation will be a review of commercial and developmental materials used as Reinforcements or Polyolefins. A survey of the natural minerals used, key synthetic reinforcements, Bio based reinforcements will be covered. The presentation will cover the relative cost, and implications to properties, as well as recent developments regarding emerging applications. Microscopy of the polymer interfaces will also be discussed.

Emissions of Polypropylene Compounds

Dr. Laura Shereda
Asahi Kasei Plastics
North America

Due to changes in fuel economy requirements and moving towards sustainability, emissions of plastic automotive components are under ever increasing scrutiny. This paper will describe the current situation of plastic emissions and routes Asahi is taking to improve emissions of polypropylene materials.

Comprehensive, In-Process and Full-Cabin Analysis of VOC Emissions

Yan Li*, Diandree Padayachee, Vaughan Langford, Daniel Milligan
Syft Technologies

With increasing pressure to reduce harmful VOC emissions in motor vehicle passenger cabins, more frequent component testing will be required to ensure conformance. Selected Ion Flow Tube Mass Spectrometry (SIFT-MS) is an industry-proven analytical technique that instantly and directly analyzes harmful and regulated VOCs in air. This presentation will introduce SIFT-MS and its automotive component testing applications, including high-throughput testing using an integrated autosampler. SIFT-MS provides a very economical solution for screening automotive components.

Comprehensive, High-Throughput Analysis of VOC Emissions from Automotive Components

Yan Li*, Diandree Padayachee, Vaughan Langford, Daniel Milligan
Syft Technologies

With increasing pressure to reduce harmful VOC emissions in motor vehicle passenger cabins, more frequent component testing will be required to ensure conformance. Selected Ion Flow Tube Mass Spectrometry (SIFT-MS) is an industry-proven analytical technique that instantly and directly analyzes harmful and regulated VOCs in air. This presentation will introduce SIFT-MS and its automotive component testing applications, including high-throughput testing using an integrated autosampler. SIFT-MS provides a very economical solution for screening automotive components.
Using Hollow Glass Microsphere Masterbatches to Optimize Formulations at the Injection Molding Press

Stephen Amos*, Mark Williams, Andrea Charif
3M Company

Hollow Glass Microspheres or Glass Bubbles are an accepted light weighting technology for injection molded plastics used in transportation applications. The benefits of using hollow microspheres go beyond lightweighting and include dimensional stability, cycle time reduction and reduced sink and warpage. Often times there is a need to balance weight reduction with changes in physical properties. Using a high concentration masterbatch of these materials, at the press, can speed the optimization of a light weight resin formulation.

Opportunities for Lightweight Reinforced Polyolefins Utilizing Mixed Morphology Clays

Daniel Berg
BYK USA Inc.

The CAFE Standards are the driving force for polyolefin compounds innovation. Improving material strength and reducing overall part weight is a primary strategy getting significant focus. Mineral fillers contribute to composite compound weight and density. However, mixed morphology clays offer ultra high surface area and aspect ratio to reduce mineral content. Density is further reduced while maintaining material property performance. This technology offers reduced scratch and mar, increased cycle time, improved dimensional stability and processing.

Anisotropic Fatigue Analysis of Short Fiber Filled PP for Structural Applications

Rodrigo Orozco
Asahi Kasei Plastics

Short fiber filled engineering plastics are currently used in applications that are required to meet more demanding specifications, including fatigue. Anisotropic fatigue analysis of short fiber filled thermoplastics is an innovative solution to obtain an accurate prediction of the fatigue life of a component with Computer Aided Engineering (CAE) tools. This study presents a correlation of CAE results vs. experimental quasi-static and fatigue analysis results; and depicts the method for completing anisotropic fatigue analysis with commercial CAE tools.

Green Materials with Improved Air Quality Inside the Passenger Cars

Zhongfu (Jerry) Luo*, Dr. Bo Yang
Kingfa Sci & Tech

Requirement for lower VOC emissions from automobile interior components is getting more stringent with awareness of health effects caused by the VOCs. The odor evaluation results are greatly dependent on the subjective judgment, so the training from OEMs is critical. Controlling VOC and odor of plastic compounds requires a continuous optimization process in raw material selection, recipe modification and processing parameter settings. The well controlled “green” materials have significantly lower VOC and odor, compared to the original formula.
We are a Leading Compounding Company with a Strong Global Footprint

Our headquarters is located in Guangzhou, China, with plants throughout Asia-Pacific, Europe, and North America.

We are dedicated to providing a total package which combines material science and value-added technical solutions.

**AUTOMOTIVE:**
KINGFA develops plastic compounds with new technologies such as lightweight, low emissions and surface enhancement, etc.

**NON-AUTOMOTIVE:**
KINGFA provides polymer solutions for a wide range of applications such as home appliances, IT, lighting, electrical and electronics, tools, etc.

Become the most respected manufacturer in industry and the best new material enterprise in the world.
SIRMAX
Global solutions for Automotive in PP/TPO Compounds

IMIFABX
tune in to innovation

PERFORMANCE MINERALS

TALC
- The industry’s most complete talc portfolio produced from North American ore sources

MICA
- Maximum reinforcement and low warpage of parts

WOLLASTONITE - Formerly NYCO Minerals
- North American production, proven reserves, consistent supply

For more info: northamerica@sirmax.com - (765)639-0300 - www.sirmax.com
SIRMAX is an ISO/TS 16949 certified company

plastictalc.americas@imerys.com
www.imerystalc.com

Oct 2016
A Review of Advanced UV Stabilization Solutions Enabling TPO to Meet Automotive Needs

Jian-Yang Cho*, Jerry Eng, Dr. Andrea Landuzzi, Brent Sanders
Cytec Solvay Group

New developments in additive technologies are accelerating the creation of new opportunities for polyolefins in Automotive. Due to their versatility and ability to acquire new properties through formulation development, the application scope of TPO has expanded in automotive interior and exterior designs. On the aesthetic front, to create metallic appearances and brighter and more dazzling colors, aluminum effect pigments has grown in popularity. This paper will examine the enabling UV technology that drives tomorrow’s innovation.

High Performance Stabilization Systems for PP and PP-based TPO Automotive Applications

Songwon Industrial Co., Ltd

Exterior and interior automotive parts based on polypropylene (PP) thermoplastic polyolefin (TPO) compounds exposed to sunlight and elevated temperatures during service life must be stabilized to suppress the deleterious effects of prolonged UV and heat exposure, respectively. The need for improved weatherability, color stability, gloss retention, reduced VOC and FOG, as well as, other secondary effects must also be weighed against the cost effectiveness of the TPO compound.

Superior Weathering Solution for PO Based Automotive Parts Using Advanced Hindered Amine Light Stabilizers

Yota Tsuneizumi
Adeka Corporation

Plastic automotive parts which are exposed to sunlight must be protected to suppress the deleterious effects of prolonged exposure to ultraviolet light. Hindered amine light stabilizers (HALS) are typically utilized to prevent this degradation from UV radiation. This paper describes the features of the advanced N-H,N-Me, and NO-Akyl type HALS and the appropriate usage of these HALS for a number of desired improvements of automotive parts including soft skin application.

Performance Comparison of Mineral-filled TPOs

Maziyar Bolourchi
Imerys

The performance of mineral additives, primarily talc, mica and Wollastonite investigated/compared along with glass fiber and calcium carbonate in automotive TPOs. The performance of each additive has been obtained at its optimum melt compounding conditions to maximize end performance. Properties investigated include stiffness/impact, heat distortion temperature (HDT), color, shrinkage, scratch resistance and melt flow rate.
HTP1s: a Novel Talc Additive for Smart Polymer Processing

Piergiovanni Ercoli Malacari
IMI Fabi Spa

In polymer modification, when high flowability and dust free behavior are requested for additives, the new talc additive HTP1s can be the answer. Where ever talc is considered as functional additive for polymers, the advantage of this novel product is that its bulk handling is visibly improved, with strong advantages for dosing, and blending with other additives (i.e. in pre-mixes). The paper will show main HTP1s features.

Case Studies of Additives’ Impact on Part Performance

David Fortener*,
Sam He
Inteva Products LLC

Additives for thermoplastic materials are critical for achieving desired plastic/polymer processing, material properties, and part performance. However, due to the complicity of the engineered plastic system, the compatibility among the additives and miscibility between additives and polymer/plastic domain could also be challenges. Those challenges not only influence to material processing and properties, but also impact on product functions and performance. This paper, through case studies, discuss how to understand the challenges and potential solutions.

Expanded Uses of Leading-Edge Impact Modifiers for TPOs

Jeff Munro*,
Jim Hemphill,
Russell Barry
The Dow Chemical Company

This paper outlines what makes an impact modifier effective and why Polyolefin Elastomers have become the impact modifier of choice for TPOs. One can further enhance TPO performance with modifiers having unique molecular designs to address the latest challenges highlighted by Tier 1 and OEMs including improvements in lightweighting, paintability, and use of alternative filler systems. This paper will also include a look at a novel propylene-based olefin block copolymer providing new TPO performance characteristics.

The use of Post-Consumer Materials to Produce TPO Quality Resins for Automotive Applications

Mike Monpetit
Buckeye Polymers

The industry for the harvesting and collection of post-consumer resins (PCR) to yield specific streams of plastic materials has expanded tremendously in the past several years. Buckeye Polymers has several years of refining the olefinic portions of the PCR stream to yield input feedstreams for production of families of high impact polypropylene copolymers and TPOs. The resulting products meet the part performance requirements for use in various automotive applications ranging from functional black plastic parts to fascias and are currently used for these applications within the industry.
Discover our innovative technologies for interior materials used in automotive

Stahl, in partnership with Rinspeed - the leading company in concept car development, has designed the ultimate customer experience within the new concept car: Σtos. Stahl’s innovative car interior solutions are a highlight of the concept vehicle’s cockpit & interior elements.

Seat cover surfaces, accent color weather stripping, door trim surfaces, dashboard & steering wheel surfaces all showcase Stahl’s designs and new technologies from their innovative product lines.

www.stahl.com

NEED LIGHTER MATERIALS?

RTP Company has a proven portfolio of high performance thermoplastic compounds for mass reduction
- Stiff and tough long fiber
- Lighter carbon fiber
- Glass microspheres
- Higher performing polypropylene (PP)

Contact: Dave Pahl • +1 (248) 207-8224 • dpahl@rtpcompany.com
www.rtpcompany.com

VersaHeat™
Multi-zone
Stamped Foil
Engineered Infrared Heating System
Designed for Automotive Applications

1985 - 2016
CELEBRATING OUR 31ST ANNIVERSARY!
Providing Customized Engineered Infrared Heating and Curing Systems, Hot Air Ovens and Drying Systems for all Applications

Polymer Compounding and Color Specialists
RheTech’s family of companies offer an exceptional array of options to meet your compounded resin needs!

Visit our website, www.rhetech.com, to learn more about polypropylenes, TPOs, engineered resins, color concentrates and special additive packages.
As consumer expectations for interior style and comfort have increased, so have the levels of quality required for the vehicle interior. Sika technologies for lamination, flocking and assembly allow designers to deliver the attractive, soft-feel surfaces they envision, while meeting the environmental standards regulators demand. VISIT US AT BOOTH #77.

**SikaMelt**
Multi-purpose hotmelt adhesives for bonding a wide range of substrates.

**SikaSense**
Multi-Purpose adhesives for bonding plastics, wood, (synthetic) leather, cotton fibres or wood fibres.

**SikaTherm**
Multi-purpose adhesives for flocking and lamination applications.

sikaautomotive.com
Interior Trim Lamination Development
Helmut Doyen
Sika Corporation

The lamination of automotive interior has always been a challenge for the adhesive industry. Design and substrate changes of interior parts and the changes of OEM specifications required adhesive developments following the trend. The presentation shows with some examples how adhesive technology was developed from the VW Beetle in the 50’s to PP lamination with TPO skin without substrate pretreatment today and what the vision is for the future.

A New Adhesive for Automotive Interior Lamination
David Speth*, Jeff Swoboda
Evans Adhesives
Andres Sustic, Scot Wakefield, John Passmore
Rextac

Our team has recently developed a completely thermoplastic laminating adhesive for interior cover stock-to-substrate assembly. This new adhesive is designed to allow OEM and Tier manufacturers to use polypropylene and TPO substrates without corona or flame treatment in place of ABS and ABS/polycarbonate blends for interior structures. It also allows manufacturers to avoid the work-in-process inventory and post lamination cure time delays necessary when moisture reactive olefin or urethane adhesives are used. In this presentation we will describe our initial results.

Infrared Heating for Successful Lamination
George Cozzarin*, Joshua Miller
Radiant Energy Systems, Inc.

A challenge in press lamination of PP parts to TPO skin for automotive interiors is the uniformity of heating the laminating adhesive on the back side of the TPO for a strong and consistent bond. Typically the molded PP part and the skin are secured in lower and upper molds, the heater bank moves in to heat the parts to the desired temperature, then retracts and the two components are pressed together for the lamination.

Achieving Weight Reduction – Thin-Wall and Low Density Exterior Applications
Dr. Linda Havermans
SABIC

Automotive industry is challenged to reduce weight to improve fuel efficiency and reduce emissions. Adding ribs and other features – can make possible weight-out in semi-structural plastic parts. Reducing weight is much more difficult in non-structural parts produced from PP compounds, like bumper fascias. For exterior applications, the trends are towards low density and thin-wall applications. This paper highlights innovative approaches (with examples) to achieve weight savings with minimal tradeoffs for each of these trends and a combination of both.
PO Hotmelt Adhesive Technology in Automotive Interior Components

Sebastien Meliot  
Jowat Adhesives

TPO soft trim materials, PP based substrates and polyolefin based hot melt adhesives are an ideal match in terms of material costs savings, weight reduction and recyclability. This is well known. But additional to this, new products and processes can offer a new dimension of manufacturing efficiency, quality improvement and scrap reduction as well as shortened prototype phases and earlier reliable tooling cost calculations. How these outstanding benefits can be achieved by using the VACFLOW technology in combination with a matching high performance Polyolefin Hot melt will be presented.

Evaluation of Coating Performance Based on an ASTM7027/ISO19252 Standard

James Chrisman*,  
Dr. Hung-Jue Sue,  
Dr. Masaya Kotaki,  
Mukund Shastry  
Texas A&M University

Scratch and mar performance of polymeric coatings and films is still commonly graded based on the results of pencil hardness testing methods. In this work, the ASTM D7027 / ISO19252 method is investigated as an alternative, in which most of the deficiencies of the pencil hardness tests are overcome by controlling load range, testing rate, and scratch tip geometry.

Improved Performance for Automotive Textiles using Surface Modification Technology

Chris Hagler  
Gouston Technologies, Inc.

Textile fibers and composites are an integral part of today’s automobile technologies. The key to providing the optimum value from the converted fibers lies in the ability to modify the fiber surface to provide the target functional properties. Gouston Technologies uses surface modification via topical treatments to achieve enhanced OEM performance requirements in odor control and antimicrobial protection of the textile surfaces.

Evaluation of Coating Performance Based on an ASTM7027/ISO19252 Standard

James Chrisman*,  
Dr. Hung-Jue Sue,  
Dr. Masaya Kotaki,  
Mukund Shastry  
Texas A&M University

Scratch and mar performance of polymeric coatings and films is still commonly graded based on the results of pencil hardness testing methods. In this work, the ASTM D7027 / ISO19252 method is investigated as an alternative, in which most of the deficiencies of the pencil hardness tests are overcome by controlling load range, testing rate, and scratch tip geometry.

Improved Performance for Automotive Textiles using Surface Modification Technology

Chris Hagler  
Gouston Technologies, Inc.

Textile fibers and composites are an integral part of today’s automobile technologies. The key to providing the optimum value from the converted fibers lies in the ability to modify the fiber surface to provide the target functional properties. Gouston Technologies uses surface modification via topical treatments to achieve enhanced OEM performance requirements in odor control and antimicrobial protection of the textile surfaces.
Delivering what you need, WHEN YOU NEED IT.

From material selection to innovative solutions

As a global leader in automotive thermoplastics distribution, we’re dedicated to your product’s success. We partner with the world’s top suppliers to provide you access to a broad range of resins.

Our locally dedicated technical and sales team are with you in every step of your process, from innovation to production.

Come speak with our technical experts at the Nexeo Booth.

SPECIALTY ADDITIVES • RESINS • PIGMENTS

Performance Purging Partner of Automotive Interiors Molders Since 1992

PurgeX™ Purging Compounds

www.purgexonline.com/free-sample 800-803-6242

Come to our booth and ask what PurgeX® 742 can do for you!

www.purgexonline.com/free-sample 800-803-6242

Come to our booth and ask what PurgeX® 742 can do for you!

Technology & Service in Perfect Balance™

Ask us How your Products can be Enhanced by our Additives & Custom Solutions

LINXIDAN® MaH & Silane Grafted Coupling Agents
LUBIDAN® Silicone & Lubricant Masterbatches
ARMIDAN® Functional Impact Modifiers
EXTINITY® Flame Retardant Masterbatches
CUSTOM TOLLING Working With You Confidentially

+1 844-SACO-AEI | sales@sacoai.com | www.sacoai.com

You can — when you work with PolyOne. Our InVisiO® color and design specialists help you tailor experiences for your target audience by leveraging color trends and inspirations across multiple industries.

Color design insights
Inspirational color stories
Color training

Visit invisicolor.com to make it possible.

You can — when you work with PolyOne. Our InVisiO® color and design specialists help you tailor experiences for your target audience by leveraging color trends and inspirations across multiple industries.

Color design insights
Inspirational color stories
Color training

Visit invisicolor.com to make it possible.
What if you could inspire the next generation?

You can — when you work with PolyOne.

Our InVisiO™ color and design specialists help you tailor experiences for your target audience by leveraging color trends and inspirations across multiple industries.

Color design insights
Inspirational color stories
Color training

Visit invisicolor.com to make it possible.
Growing Importance of More Sustainable Materials for the Automotive Industry


Sustainability can be defined as a balance of social, environmental and economic parameters allowing for an indefinite and healthy existence. Beyond demonstrated leadership in using plant-based materials, Ford has been also reducing its use of energy, water and waste. The WWF Biofeedstock Alliance increases awareness of the environmental/social performance of bio-feedstocks, and uses science to guide the responsible selection of materials.

Biobased Headlamp Housing for Automotive Lighting

Ayse Ademuwagun
Varroc Lighting

Miscanthus or switchgrass fibers are bio-sourced and renewable materials that can be used as fillers in various polymer matrices. Carbonization and oxidative acid treatments make these bio-material more compatible with polypropylene matrix with polypropylene matrix. These bio-carbons would replace talc to reduce the part weight by 8-20%, would reduce carbon footprint and improves sustainability of automotive industry. In this study, headlamp housings parts made with bio PP were compared and tested against talc PP performance.

Effect of Low Temperature Heat Treatment on Bamboo Fiber Reinforced Composites

Amy Langhorst*, James Burkholder, Alper Kiziltas, Ellen C. Lee, Deborah Mielewski
Ford Motor Company

The use of sustainable composites is becoming increasingly favorable in the auto industry. This study investigated the effect of low temperature heat treatment of bamboo fibers on the properties of recycled polypropylene (rPP) + recycled polyamide-6 (rPA6) + bamboo composites. Samples were produced via extrusion and injection molding. The resulting properties were investigated on a macroscopic and microscopic scale. The composite properties were compared to physical requirements for under-the-hood automotive components.

The Use of Micron-size Tire Rubbers as Reinforcement Fillers in the Twin Screw Extruder Compounding of Recycled Thermoplastic Polyolefins to Improve Elastomeric Properties

Haikun Xu*, Lavon Detweiler
Entech, Inc

In this study, micron-size rubber powders (MRPs) were fabricated from recycled truck tires in large volume, and used as fillers for the twin screw extruder (TSE) compounding of recycled TPOs. TPO was chosen as the base resin for compounding because of its excellent reprocessibility, good compatibility with the micron-size tire rubbers, and reasonable low cost. The physical and mechanical properties (hardness, MFI, tensile, Izod impact, etc) were tested to study the overall performance of the compounds for automotive and commodity applications.
Natural Fiber Filled Polyolefin Filaments for 3D Printing

Robert Joyce
Innovative Plastics and Modeling

Polyolefin and natural fiber compositions are very difficult to generate filaments and 3D print. This presentation will discuss biopolymer technology for alternative polyolefin natural fiber compositions that have been 3D printed for various commercial applications. He will explain the advantages of the biopolymer compositions he has produced, showing a comparison to the ABS and PLA filaments. Robert will provide material data with samples showing the unique characteristics of FibreTuff biopolymers for 3D printing.

Origin and Control of VOC and Odors in Polyolefin Biocomposites

Dr. Damien Maillard*, Karen Stoeffler
National Research Council Canada

In this presentation, NRC will explain the mechanisms of formation of VOC in polyolefin biocomposites, and will relate them to the processing and service life conditions. A case study will be presented in which the VOC produced during the exposure of polyolefin biocomposites to humidity, temperature and light, were identified and quantified. Various approaches to control and reduce the VOC and odors emissions in these materials will also be presented.
Transform the Performance of your Polyolefin Formulation With The Dymalink® 9000 Series

Performance increase up to:
- 10% in tensile strength
- 30% in modulus
- 15% in HDT

Smart way of SAVING RAW MATERIAL COST
INNOVATIVE TECHNOLOGY AND R&D
SOLUTIONS IN MATERIAL RECOVERY IN FORM OF REPROCESSED PELLETS:
- RECYCLED COMPOUND (PP):
  - PP WITH GF & TF @ COMPETITIVE PRICE
- PAINTED BUMPERS (TPO):
  - DE-PAINT
- DASHBOARD SKIN (PP/TPO):
  - REMOVAL OF CROSS-LINKED FOAM AND COATINGS
- LAMP HOUSING (PC):
  - DE-PAINT AND DE-METALIZE
- FRONT GRILL & FACIA (PC AND PC/ABS):
  - DE-CHROME AND DE-METALIZE

TOLL PROCESSING : SCRAP MANAGEMENT : MATERIAL SOLUTIONS

www.kalpolymers.com
customerservice@kalpolymers.com

For years, the automotive industry has turned to Branson’s plastics joining expertise to meet the challenge of modern automotive manufacturing. Whatever your need, you can count on Branson’s unrivalled technology options and innovative application development.

Visit bransonultrasonics.com or call 203.796.0400 | 586.276.0150.
Technology
Drives us Forward
...Quickly

We provide fast-turnaround, turn-key solutions for the automotive industry, with an effective global footprint that allows us to go to prototyping quickly and cost-effectively. This leads to faster times to market and unrivalled deliverable consistency. VINTECH has produced a plethora of quality products for some of the world’s leading car manufacturers and brands, and there is no end to the challenges or imaginative solutions we provide our Tier I customers.

With over 100 extruders globally, we offer our automotive customers very flexible manufacturing plans designed to their exact specifications. Our global manufacturing strategy uses the very latest in advanced MRP software. Each of our more than 80 extruders can be placed in any configuration to create a zero risk if any breakdowns were to occur. And our extrusion tooling is also standardized, so the product can be manufactured on many different extrusion lines in all of our global locations.

See why VINTECH keeps moving the needle and drives innovations for our partners @ www.vintechplastics.com.

YOUR TEAM AROUND THE WORLD
Why TPOs are the Right Choice of Materials for Automotive NVH Reduction

Sassan Tarahomi
IAC Group

Vehicles produced today have much quieter cabin because the customer demands it. TPOs have the unique combination of material and processing properties to enable designers to create the most desirable vehicle without sacrificing any NVH performance. This paper addresses why TPOs are becoming very popular for vehicle NVH control. A survey of several TPO material along with part design guideline, processing requirement and vehicle NVH performance requirement are reviewed in this paper.

Adding Value to an Injection Molded TPO Front of Dash Barrier

Meagan Marko*, Mike Campbell
Cascade Engineering, Noble Polymers

This paper will focus on injection molded TPO barrier layer and the value that can be realized by exploiting this technology. The precision and flexibility of injection molding offers many opportunities to increase value proposition. This technology is further strengthened by material design as the TPO barrier properties are fine tuned to meet the most stringent part objectives. Examples of the value provided by tool/part design coupled with customized material enhancements will be showcased.

Bonding Properties Between TPVs and Cured Rubber for Automotive Profiles

Noriyoshi Ono*, Masato Kobayashi, Kentaro Kanae
JSR Corporation

Thermoplastic vulcanizates (i.e. TPVs) are a special class of thermoplastic elastomer and has been widely used in many industrial applications especially for environmental friendliness and cost reduction.

When using TPVs for automotive profiles, it is required for the TPVs to have high bonding strength with cured rubber and to have an understanding of the bonding properties between TPVs and the cured rubber. This paper discusses cured rubber formulations and the TPVs properties which influence bonding properties.
JSR EXCELINK
The most advanced TPO material in the world

- Dynamically vulcanized TPO injection grade material
- Shore A hardness range from 20A ~ 80A
- Ultra-high bond strength to cured EPDM rubber
- High melt flow rate and consistent injection moldability
- Super low COF ~ high slipperiness ~ eliminates need for post-coating

JSR Trading, Inc.  |  Jeff Saint 269-209-1516  |  jeffsaint@mac.com
5300 DuPont Circle, Building 16, Suite D, Milford, OH 45150  |  TEL +1.513.421.6166

Cowl Vent Grille - Chevy Equinox

Driving Custom Compounded Solutions
Specialists in Formulation Development, TPO Compounding and Contract Manufacturing

www.noblepolymers.com

Utilization of state-of-the-art manufacturing facilities coupled with an extensive product mix makes Arctic Minerals the “best choice” for all your Mica needs.

Visit Us at Booth #47
**Introducing:**
**FortiTalc™** compacted Talc

- Less dust and more consistent feeding
- Multiple bulk densities to match compounder process
- Improved bulk shipping economics

For more information, stop by our tabletop display today! We can also be reached at 800-801-1031 or www.mineralstech.com

---

**Distributed to the Americas by**

**Chemroy**

We Can Help You With:
- Functional Polymers
- Additives & Processing Aids
- Fillers & Extenders
- PIB Master Batches

**TPO • TPE • TPV**

www.chemroy.com

sales@chemroy.ca

1.888.243.6769

---

**MRC Polymers**

Engineered and Sustainable Resins

www.mrcpolymers.com

From Plastic Scrap to HIGH QUALITY RECYCLED RESINS

- No Sacrifice in Performance
- OnSpec Every Time
- Custom Formulations
- Meets Virgin Specifications

Products: ABS, Nylon, PC/ABS, PC/PT, PC/PET, Polycarbonate, Polypropylene, TPO

PolyAd Services

- Automotive Interior
- Exterior Wind Deflectors
- Underhood (Seals & Air Management)
- Weather Seals
- Wiring Jackets

We are your dedicated global supplier of high quality, thermoplastic resins for automotive applications.

Society of Plastics Engineers

ELASTRON THE TPE SPECIALIST

Serving Plastic Processing Industries Need for Plastic compound, color, additive concentrates.

Sushrut Polymers is a North American Distributor of Prayag Polytech Pvt. Ltd. based in Toronto, Canada. We are specialized in custom and standard colors, additive and talc masterbatches for Automotive industries.

Contact:
Kumar Satyandra
Sushrut Polymers
123 Orenda Road,
Brampton, ON L6W 1W2
Canada
Ph. 416 554 7893
sushrutpolymer@gmail.com

www.mcpp-global.com
If your company is involved in extrusion—be it film, sheet, pipe, profile, tubing or compounding, or some combination thereof—Extrusion 2016 is for you!

The conference presentations consist of morning sessions devoted to technical and business issues common to all types of extrusion, followed by breakout sessions devoted to specific types of extrusion. These presentations, together with the exhibits at Extrusion 2016, will give you unprecedented access to new technology, tips and techniques, and best practices aimed at helping you boost efficiencies at your operation.

SPE ACCE ATTENDEES—REGISTER TODAY & SAVE $100! Use Promo code: SPEACCE16

To register, for more information, or for a list of confirmed presenting companies, please visit: ExtrusionConference.com
The Molding Blog is a news site focusing on advanced plastics technologies.

www.themoldingblog.com
橡塑市场先机 尽在指间掌握
Stay Ahead of the Curve in Plastics Market with CPRJ Multimedia Communication Tools

印刷杂志 Prints
《中国塑料橡胶CPRJ》和CPRJ国际版
China Plastic & Rubber Journal & CPRJ International

电子报 eNews

研讨会 Conference

在线订阅 SUBSCRIPTION AdsaleCPRJ.com/Members
超过 600,000 位专业人士通过CPRJ获取最新市场新闻和技术报导。
More than 600,000 industrial professionals depend on CPRJ for latest market news & product technology.

马上注册即享5大权利
Register as a member to enjoy 5 benefits
1. 每周电子报 eNews Weekly
2. 产品查询 Product enquiry
3. 文章刊登机会 Articles publication
4. 展会论坛参观特惠 Discounts for admission of exhibitions & conferences
5. 读者个性化服务 Customized readers service

雅式出版有限公司 Adsale Publishing Limited
(雅式集团 Adsale Group)
邮件：cprj@adsale.com.hk

关注CPRJ官方微信
Subscribe “CPRJ” on WeChat
SEEING ELASTOMERS
WITH DIFFERENT EYES...
Most plastics industry decision-makers get their information from *Plastics Engineering* – but we are much more...

We Connect to the Plastics Marketplace Through Our Digital Media

- Newsletters
- Websites
- Blogs
- Custom Eblasts
- Sponsored Webinars
- Online Academic Journals

Talk to us any time to meet your marketing needs for the upcoming K Show 2016. Tell us what you need and want – and our promise is to DELIVER.

See How Powerful the right partnership can be

**CONTACT: ROLAND ESPINOSA**
Tel (201) 748-6819 • Fax (201) 748-6667
E-mail: respinosa@wiley.com
The SPE TPO Automotive Engineered Polyolefins Conference would not exist without the gracious support of our sponsors, who underwrote the cost of facilities and equipment rentals, food and beverages, production and printing of our program guide, and many other items, large and small. Hence, it is with great appreciation that we thank and acknowledge the contributions of our 2016 sponsors, exhibitors, and other patrons in making this event a success.

**PLATINUM SPONSORSHIP**

- Advanced Composites, Inc.
- Sumitomo Chemical America, Inc.
- Trinseo LLC
- Washington Penn Plastics Co., Inc.

**GOLD SPONSORSHIP**

- A. Schulman
- Asahi Kasei Plastics North America, Inc.
- Borealis AG
- Braskem
- CIMBAR Performance Minerals
- Datapoint Labs
- The Dow Chemical Co.
- ENPLAST Americas, a Ravago Group Company
- ExxonMobil Chemical Co.
- Formosa Plastics Corporation, U.S.A.
- H.B. Fuller
- Imerys Talc
- Inteva Products LLC
- LyondellBasell Industries
- Mitsui Plastics, Inc.
- Multibase, a Dow Corning Company
- Mytex Polymers US Corp.
- PolyOne
- Robert Eller Associates
- SABIC
- Wellman Advanced Materials

**MEDIA / ASSOCIATION SPONSORSHIP**

- Automotive Design & Production Magazine
- China Plastic & Rubber Journal
- China Plastics & Rubber Journal International
- Industrias Plásticas
- Noticiarió del Plástico
- Plastics Engineering Magazine
- Plastics Insight
- Plastics Technology Magazine
- Plastics Technology México
- Prototype Today
- Recicado
- The Molding Blog
- TPE Magazine
- WardsAuto.com

**EXHIBITORS**

- 3M Advanced Materials
- Addcomp North America, Inc.
- Adell Plastics Inc.
- American Chemistry Council - Plastics Div.
- Americhem, Inc.
- Arctic Minerals, LLC
- Autodesk Inc.
- Branson Ultrasonics Corp., a Business of Emerson Electric Co.
- Canuck Compounds Inc.
- CGT
- Chase Plastic Services, Inc.
- Chemtroy Canada Inc.
- Clariant Corp.
- Coperion
- Cray Valley, a Brand of Total
- Croda International Plc.
- Elasticon
- Entec Polymers
- Haartz Corp.
- Henkel Corp.
- IMI Fabi LLC
- International Automotive Components (IAC Group)
- Jowat AG
- JSR Corp.
- Kal-Polymers Inc.
- Kinfras
- Lotte Chemical Alabama Corp.
- Maroon Group LLC
- Milliken & Co.
- Mitsubishi Chemical Performance Polymers
- Modern Dispensers, Inc.
- Monark Equipment Technologies Co.
- MRC Polymers
- Neutex, Inc.
- Nexeo Solutions
- Noble Polymers
- Plasmatreat US LP
- PolyAd Services
- Prochimir Inc
- Quantum Analytics
- Radiant Energy Systems, Inc.
- Reliable Analysis, Inc.
- RheTech, Inc.
- RTP Company
- Saco AEI Polymers
- Sika Automotive
- Sirma North America Inc.
- Songwon Industrial Co., Ltd
- Specialty Minerals
- Stahl Performance Coatings
- Struktol Company of America
- Sushrut Polymers
- Techmer PM
- Uniform Color Company
- United Paint & Chemical Corp.
- Vintech Industries

* Reception Sponsor  ◆ Lunch or Break Sponsor  ● Tote Bags, Lanyards, USB Flash Drive, Pins, Hotel Key Sponsor  ◆ Ad Upgrade  ▲ Advertising Sponsor  ◆ No Exhibit
Advanced Composites is proud to be a member of the Mitsui Chemicals & Prime Polymers commitment to the Global Automotive Market. With compounding resources throughout the globe (North America, South America, Japan, Europe, Thailand, China and India), the Mitsui Chemicals group is well positioned to service your engineered PP requirements.

www.advcmp.com
(937) 575.9800