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**Mike Balow,**  
Auxin Consulting, LLC



**Rob Philp,**  
Sirmax

Welcome to the **2024 SPE TPO GLOBAL AUTOMOTIVE CONFERENCE** – the World’s Leading Automotive Polyolefins Forum! This year, we have a particularly special reason to celebrate: *It’s our 25th Anniversary Conference!*

Over the past quarter-century, we’ve not only grown into a premier event, but we’ve also helped shape and witness the remarkable innovations in the automotive polyolefins industry. Our theme this year, **25 Years of Innovation**, reflects that journey – from groundbreaking technologies to sustainable solutions that are transforming the automotive landscape.

The 2024 Planning Committee, along with the Society of Plastics Engineers (SPE) Detroit Section, is thrilled to welcome you to this historic occasion. It’s not just another conference – it’s a celebration of 25 years of collaboration, learning, ingenuity and forward-thinking, with a firm eye on the future.

Our Keynote Addresses showcase leaders like Bob Flotkoetter from Nissan, who will kick things off on Tuesday, October 1st, discussing *Automotive Sustainability and the Role of Materials in Ambition 2030 and Beyond*. That same afternoon, Jeff Stout from Yanfeng will take us on a journey through time with his presentation, *Predicting the Future of Automotive Interior Surfaces by Looking Back in Time*.

On Wednesday, October 2nd, we are excited to have Linda Wright from ExxonMobil share her insights on *Value Chain Collaboration: Key to a Successful Circular Economy for Plastics*.

Thursday, October 3rd will showcase David Helmer from General Motors, as well as Sheila Sarver from Inteva Products, who will bring their expertise to the table with two powerful Keynote talks on TPO industry trends and circularity in automotive interiors.

This year’s comprehensive Technical Program features much more than just excellent speakers presenting their latest developments. We’re honoring our heritage by introducing new interactive Panel and Plenary Discussions featuring the Founders of the Conference, who will reflect on how the industry has evolved over the past 25 years, the challenges overcome and where it’s heading next.

In our efforts to offer increased and informative OEM perspectives, you’ll also hear General Motors tackle the crucial topic of Life Cycle Analysis, an increasingly important consideration in today’s automotive world. Drew Geda from the Hyundai-Kia Technical Center will also elaborate on Hyundai’s strategic materials development towards achieving carbon neutrality goals.

Our dynamic Technical Program has also been optimized – as we do every year - with over 60 cutting-edge presentations organized into seven Technical Sessions, emphasizing sustainability and new technologies like additive manufacturing and biocarbon-reinforced polyolefin composites.

Plus, our Exhibition will offer exciting opportunities to experience the latest innovations from our Sponsors and Exhibitors, all of whom represent the key companies engaged in polymers and mobility today.

As we commemorate 25 years of driving innovation, we’re not just looking back—we’re building connections and lighting the path forward. With over 700 attendees expected representing the entire value chain, our sponsored receptions, extended exhibition hours, and countless opportunities to network, this event is designed to inspire collaboration and foster the relationships that will fuel the next era of automotive polyolefins. We are also happy to welcome young students and future leaders from Ecotek Lab, many of whom will present their research work in a poster competition. Along with our annual TPO Scholarship program, this Conference enables the SPE Detroit Section to fund a multitude of vital academic programs for students of all ages every year.

We’d like to extend our deepest thanks to our 45-member *volunteer* Planning Committee, who have worked tirelessly for a full year to make this year’s Conference our most successful yet. Finally, this Conference would not be possible without you – **Thank You for participating with us each year!** As always, your feedback is invaluable to us. Please share your thoughts after the event, so we can continue to make each Conference better than the last.

Here’s to 25 years of innovation and a future full of exciting possibilities!

# TECHNICAL PROGRAM HIGHLIGHTS



**THE 25<sup>TH</sup> ANNIVERSARY** event of the SPE TPO Global Automotive Conference will begin with a Round Table of Founding Members to share Reflections on how the TPO Conference got started, what Factors propelled the continual Growth and to provide Perspectives on the Future. Please join this one-hour event with your questions and comments for a lively discussion.

The Program features six industry executives from Nissan, Yanfeng, ExxonMobil, Hyundai, General Motors, and Inteva Products providing Keynote presentations on growth of TPO Applications. Further a Panel Discussion is scheduled on the importance, challenges and potential of Life Cycle Analysis with technical staff from General Motors and their development partners.

The Technical Program has seven technical sessions with over 60 presentations covering a broad spectrum of topics of current interest. We used three concurrent session tracks for the two and half a day program in scheduling the presentations. The three session rooms are adjacent to each other making it convenient if you prefer to change from one session to the other. Short (about 75 words) abstracts of all talks are included in the Proceedings Book and on the conference website (along with copies of all presentation files) for your convenience in selecting specific talks you want to attend.

The conference program also includes Marketing Presentations of the conference sponsors and Exhibitors in the Niles Room on Wednesday (run concurrently with the Technical Program). Further the conference features a Student Poster Contest and please make time to review the posters and encourage students to pursue careers in plastics.

Three Co-Chairs for each of the 7 sessions have shared the responsibility for recruiting quality presentations and working out all the logistics in gathering all required documentation in a timely manner. The session chairs have complete autonomy in running their session for providing greater value to the participants. We are fortunate to have highly dedicated session chairs who recruited superb quality presentations on cutting edge technologies. The Program Schedule provides details of the session chairs and their affiliations.

The Session Chair's mission is to ensure both the presenters, and the participants have pleasant experiences and receive enhanced value with the interactions. Based on the available time after the presenter concludes the talk, the session moderator will facilitate discussions with Questions and Answers. We urge you to engage the presenters in discussion for elaboration of details and for improved clarity of the subject discussed. The presenters will be delighted to address any questions and gratified to know the interest you showed in asking for clarification. Further the value of the conference improves with the dialogue and discussion during the conference.

We believe strongly that we gain greater value with personal interactions with the presenters at a conference than simply listening to the talks. Please seek out the presenters during breaks, lunches or receptions and get to know and engage them in discussions for improved learning. Remember both you and the presenter have a commonality of interest on the same technical topic.

Thank you for supporting the conference with your participation. Please provide us with feedback on what you have liked and how we can improve. More importantly we seek your support for next year's event by volunteering to organize a session (for recruiting presenters) or by joining the organizing committee (for managing sponsorships and exhibits).

## TECHNICAL PROGRAM CO-CHAIRS



**Dr. Norm Kakarala,**  
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## TECHNICAL PROGRAM CO-CHAIRS

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Dr. Sasan Tarahomi, Alterra Holdings | Karen Rhodes-Parker, SPE Detroit Section

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### EXTERIOR TRIM & STRUCTURAL APPLICATIONS

Mark Pilette, Magna Exteriors (Retired)  
Charlie Yang, LyondellBasell  
Kevin DeGrood, Borealis Compounds, Inc.

### PROCESS ENABLING & ADDITIVE TECHNOLOGIES

David Kosse, Ascend Performance Materials  
Dr. Suresh Shah, SPE Fellow, Plastics "Hall of Fame" Inductee; Delphi (Retired)  
Anand Bora, Moldex 3D

### SUSTAINABILITY

Mark Allen, Dow  
Dr. Murali Reddy, CCC Plastics  
Dr. Petya Yaneva, SABIC

### POLYOLEFIN ELASTOMERS & VULCANIZATES

Dr. Bhavesh Shah, Lion Elastomers  
Dr. Dave Patel, GuruTech Systems, Inc  
Dr. Nadeem Bokhari, Sumika Polymers NA

### MATERIALS DEVELOPMENT

Dr. Bin Sun, SABIC  
Quentin Boll, LyondellBasell  
Dr. Birat KC, Magna International

### PERFORMANCE ADDITIVES & COLORANTS

Dr. John Mara, Amfine Chemical Co  
Heejung Kwon, Songwon  
Dr. Raziye Mohammadi, Ford Motor Co.

### INNOVATIONS IN AUTOMOTIVE INTERIORS

Dr. Pravin Sitaram, Haartz Corporation  
Austin Wagenhals, Ford Motor Company  
Hoa Pham, Sonoco Products Company

## STAFF SUPPORT

Karen Rhodes-Parker, SPE Detroit Section

## CONFERENCE SECRETARY

Mike Balow, Auxin Consulting, LLC

## TREASURER

David Okonski, IACMI Composites

## HOUSE

Rob Philp, Sirmax

## KEYNOTE SPEAKERS

Laura Shereda, Asahi Kasei Plastics NA  
Rob Philp, Sirmax  
Drew Geda, Hyundai-Kai America Technical Center  
Neil Fuenmayor, LyondellBasell (Retired)

## OEM SUPPORT

Drew Geda, Hyundai-Kai America Technical Center  
Tom Pickett, General Motors

## OPERATIONS

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Mark Allen, Dow  
Richard Umemoto, Magna Exteriors

## DAY OF CONFERENCE SUPPORT

John Bonser, Formosa Plastics Group  
Jill Houser, JPI Creative  
Laura Shereda, Asahi Kasei Plastics NA

## CONFERENCE FEEDBACK

Richard Umemoto, Magna Exteriors  
Karen Rhodes-Parker, SPE Detroit Section

## TECHNICAL SESSION COORDINATION & SUPPORT

Bill Coy, Mankiewicz Coatings, LLC  
Robert Eller, Robert Eller Associates  
Dr. Pravin Sitaram, Haartz Corporation  
Michael Shoemaker, Borealis Compounds, Inc.  
Mark Allen, Dow

## SPECIAL THANKS

Jim Alexander, Maple Press, LLC  
Mike Gryco, Mike Gryco Freelance Producer

## PROCEEDINGS BOOK

Jill Houser, JPI Creative  
Laura Shereda, Asahi Kasei Plastics NA  
Dr. Norm Kakarala, Inteva Products, LLC (Retired)  
Neil Fuenmayor, LyondellBasell (Retired)  
Mike Balow, Auxin Consulting, LLC  
Karen Rhodes-Parker, SPE Detroit Section

## COMMUNICATIONS

Beth Talaga, Dow (Retired)  
Austin Wagenhals, Ford Motor Company  
Keith Siopes, Keith Siopes Consulting  
Karen Rhodes-Parker, SPE Detroit Section  
Jill Houser, JPI Creative

## AUDIO/VISUAL

Rob Philp, Sirmax  
Mark Allen, Dow  
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## WEBSITE

Rob Philp, Sirmax  
Rob Smuck, Big Water Media  
Neil Fuenmayor, LyondellBasell (Retired)

## FOUNDERS ROUNDTABLE

Mark Lapain, Advanced Composites  
Dr. Sasan Tarahomi, Alterra Holdings

## GM PANEL DISCUSSION

Mark Allen, Dow  
Beth Talaga, Dow (Retired)

## HYUNDAI PLENARY DISCUSSION

Drew Geda, Hyundai-Kia America Technical Center, Inc.

## SCHOLARSHIP COMMITTEE

Sanjay Patel, SABIC (Retired)  
Mike Balow, Auxin Consulting, LLC  
Sunil Earath, SABIC Innovative Plastics  
Dr. Norm Kakarala, Inteva Products, LLC (Retired)  
Dr. Sasan Tarahomi, Alterra Holdings  
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## SPECIAL HIGHLIGHTS

### MONDAY 9 | 30 SETUP / RECEPTION

All Times Shown in EDT USA (UTC - 04:00)

6:30PM - 10:30PM

EXHIBITION SETUP

7:00PM - 11:00PM

EVENING RECEPTION SPONSORED BY **FORMOSA PLASTICS GROUP**

### TUESDAY 10 | 1 EXECUTIVE MARKETING FORUM

2:30PM - 5:30PM

**SPECIAL PRESENTATIONS BY OUR SPONSORS AND EXHIBITORS**  
**NILES I AND NILES II ROOM**

**NILES I**

**NILES II**

2:30PM - 3:00PM

**Mitsubishi Chemical Group**  
**Eric M. Hirzel, Director of Product**  
*Line Mgmt. - Americas*  
**Achieving KAITEKI through Innovation**

**Niche Polymer**  
**Edward Luibrand, Automotive Market**  
*Development Manager*  
**Strong Partnerships Drive Successful Sustainability-Based Projects**

3:00PM - 3:30PM

**BREAK**

**BREAK**

3:30PM - 4:00PM

**Sumika Polymers NA**  
**Chad Koss, Commercial Director,**  
*Sumitomo's Olefin Based Compounds*  
**for Automotive Applications**

**Welset Americas, Inc.**  
**Venkat Appaj, President & Managing Director**  
**UPCYCLE MASTERBATCH - Helping Incorporation**  
**of PCR Regrind in TPO Compounding**

4:00PM - 4:30PM

**LyondellBasell**  
**Ritch Koeth, Product & Application Dev. Eng.**  
**Flame-Retardant Barrier Polyolefin Compound**

**Alok Masterbatches**  
**Amit Puri, Director of Sales & Marketing**  
**Introduction of Idemitsu and SPS Business**

4:30PM - 5:00PM

**Alterra Holdings**  
**Sassan Tarahomi, CTO**  
**TerraPrene® Automotive Market**

**Golcha Minerals LLC**  
**Sumeet Verma, CEO**  
**Purest Talc for Automotive Applications**  
**from Golcha Minerals**

### WEDNESDAY 10 | 2 ECOTEK LAB STUDENT POSTER COMPETITION

9:00AM - 4:00PM

**STUDENT PARTICIPATION AND POSTER COMPETITION**

9:00AM - 11:00AM

STUDENT POSTERS DISPLAYED IN HALLWAYS

12:00PM - 4:00PM

STUDENT POSTERS DISPLAYED IN HALLWAYS

11:00AM - 12:00PM

COMMITTEE JUDGING IN NILES I & II

1:15PM - 1:30PM

POSTER COMPETITION AWARDS, HALLS I-II-III

# 2024 AGENDA

## TUESDAY 10 | 1

All Times Shown in EDT USA (UTC - 04:00)

AM 7:00	REGISTRATION / EXPO / NETWORKING / BREAKFAST		
8:15	CHAIR WELCOME REMARKS / SPONSORSHIP MESSAGE		
8:30	<b>FOUNDERS PANEL</b> 25th Anniversary Founders Roundtable		
9:45	<b>KEYNOTE</b> Automotive Sustainability Landscape and the Role of Materials in Ambition 2030 and Beyond Bob Flotkoetter, Director of Interior, Exterior and Seats Engineering, Nissan North America		
10:30	NETWORKING BREAK SPONSORED BY <b>SPE DETROIT SECTION</b>		
	HALL I	HALL II	HALL III
	<b>MATERIALS DEVELOPMENT</b>	<b>INNOVATIONS IN INTERIORS</b>	<b>SUSTAINABILITY</b>
	Dr. Birat KC, Magna International Quentin Boll, LyondellBasell Dr. Bin Sun, SABIC	Dr. Pravin Sitaram, Haartz Corp. Hoa Pham, Sonoco Austin Wagenhals, Ford Motor Co.	Dr. Petya Yaneva, SABIC Mark Allen, Dow Chemical Dr. Murali Reddy, CCC Plastics
10:45	<b>The Evolution of Thermoplastic Polyolefin (TPO) Impact Modification for Automotive Applications</b> Mark Jablonka, Dow	<b>Soft TPO (THERMOPLASTIC OLEFIN) Foam Bi-Laminate for Scoreless Applications</b> Joshua Cram, Continental	<b>Historical Use of Recycled Plastics in Automotive Applications- Myth vs Reality- Time to Change the Paradigm</b> Susan Kozora, IAC Group
11:15	<b>Proposal of Core Back Foamed Interior Achieved by High Flow SEBS</b> Kazuhisa Takagi, Asahi Kasei	<b>Design for Sustainability &amp; Recycling on Interior Parts</b> Ryan Case, Antolin	<b>The Mass Balance Approach and ISCC PLUS for Thermoplastic Olefins: Transition to a Circular Economy</b> Peter Hawighorst, ISCC
11:45	<b>Reinforced Polypropylene for Speciality and Structural Applications</b> Tariq Syed, SABIC	<b>Making your Instrument Panel or Door Panel an All-Olefin Mono-Material</b> Mark Helder, Haartz Corporation	<b>Closing the Loop: Innovations in Durable Goods End-of-Life Management</b> Kari Bliss, Hayden Latham, Padnos
PM 12:15	NETWORKING LUNCH SPONSORED BY <b>SPE DETROIT SECTION</b>		
1:30	<b>KEYNOTE</b> Predicting the Future of Automotive Interior Surfaces by Looking Back in Time Jeffrey Stout, Executive Director of Advanced Business Development, Yanfeng		
2:15	NETWORKING BREAK SPONSORED BY <b>SPE DETROIT SECTION</b>		
	<b>PROCESS ENABLING &amp; ADDITIVE TECHNOLOGIES</b>	<b>EXTERIOR TRIM &amp; STRUCTURAL APPLICATIONS</b>	<b>PERFORMANCE ADDITIVES &amp; COLORANTS</b>
	David Kosse, Ascend Performance Materials Dr. Suresh Shah, Delphi (Retired) Anand Bora, Moldex 3D	Mark Pilette, Magna (Retired) Charlie Yang, LyondellBasell Kevin DeGroot, Borealis Compounds, Inc.	Heejung Kwon, Songwon Dr. John Mara, Amfine Dr. Raziye Mohammadi, Ford Motor Co
2:30	<b>How to Predict Flow-Induced Surface Defects</b> Alex Baker, Moldex 3D	<b>MIC Metallic TPO for Exterior Applications</b> Kevin DeGroot, Borealis Compounds, Inc.	<b>Polymer Additive Technologies Contributing to Value of Automobiles</b> Daniel Turley, Amfine
3:00	<b>Tailoring Rigidity in Powder Melt Extrusion 3D Printing of Recycled Polyolefins</b> Jerry Miao, University of Wisconsin	<b>Addressing Tiger Stripe Defects of TPO for Demanding MIC Applications</b> Alberto Prieto, LyondellBasell	<b>Long-Term Thermal Stabilization Strategies in Different PP Systems</b> Heejung Kwon, Songwon
3:30	<b>Next Chapter in AI Compounding</b> Arash Kiani, Alterra Holdings	<b>Warpage Optimization of Large and Welded Assemblies</b> Erich Vorenkamp, SABIC	<b>Organoclay based Fire Retardant Synergist for Low Voltage Wire and Cable Applications</b> Anthony Carignano, Elementis Global
4:00	NETWORKING BREAK SPONSORED BY <b>SPE DETROIT SECTION</b>		
	<b>POLYOLEFIN ELASTOMERS AND VULCANIZATES</b>	<b>INNOVATIONS IN INTERIORS</b>	<b>PERFORMANCE ADDITIVES &amp; COLORANTS</b>
	Dr. Bhavesh Shah, Lion Elastomers Dr. Dave Patel, GuruTech Systems, Inc Dr. Nadeem Bokhari, Sumika Polymers NA	Dr. Pravin Sitaram, Haartz Corp. Austin Wagenhals, Ford Motor Co. Hoa Pham, Sonoco	Heejung Kwon, Songwon Dr. John Mara, Amfine Dr. Raziye Mohammadi, Ford Motor Co
4:15	<b>Sarlink TPV: Powering Sustainable Automotive Innovation</b> Pratik Shah, Teknor Apex	<b>Interior PCR Material with Enhanced Impact and Processability</b> Ben McComb, Advanced Composites Ewa Lebert, General Motors	<b>Evolution of Frunk, Materials, and Sustainability</b> Dr. Haibo Zhao, GEON Performance
4:45	<b>Designing Translucent TPO for Performance and End-of-Life Recyclability</b> Dr Raja Dharmarajan, Kraton	<b>Single Side Lamination Adhesive for Interior Trim</b> Brent Landis and Rick Snyder, H. B. Fuller	<b>Improving the UV Weatherability of Brightly Colored Automotive TPOs</b> Matt Tiza, LyondellBasell
5:15	<b>Santoprene TPV for Automotive Dynamic Body Seals</b> Abdul Jangda, Celanese	<b>Next-Generation TPE Solutions for Sustainable Innovation</b> Stephanie O'Kon, Kraiburg	<b>High-Performance Piano Black for Automotive Applications</b> Dr. Jun Tian, Birla Carbon
5:45	EVENING RECEPTION SPONSORED BY <b>ADVANCED COMPOSITES</b>		

# 2024 AGENDA

## WEDNESDAY 10 | 2

All Times Shown in EDT USA (UTC - 04:00)

AM 7:00	<b>REGISTRATION / EXPO / NETWORKING / BREAKFAST</b>
8:15	<b>CHAIR WELCOME REMARKS / SPONSORSHIP MESSAGE</b>
8:30	<b>KEYNOTE</b> <b>Value Chain Collaboration, Key to a Successful Circular Economy for Plastics</b> Linda Wright, Vice President of Product Solutions Technology, ExxonMobil
9:15	<b>PLENARY DISCUSSION</b> <b>Strategic Materials Development – Achieving Carbon Neutrality Goals through Enhanced Product Sustainability</b> Drew Geda, Senior Polymer Materials Development Engineer, Interior Plastic - Strategic Materials Hyundai-Kia America Technical Center, Inc. (HATCI), Hyundai Motor Group <b>Q&amp;A PANELISTS</b> Angelo DiLisio, HATCI; Isabel Newton, HATCI; Jeffrey Weny, HATCI

	NETWORKING BREAK SPONSORED BY <b>SIRMAX</b>		
	HALL I	HALL II	HALL III
	<b>PROCESS ENABLING &amp; ADDITIVE TECHNOLOGIES</b>	<b>POLYOLEFIN ELASTOMERS AND VULCANIZATES</b>	<b>SUSTAINABILITY</b>
10:30	David Kosse, Ascend Performance Materials Dr. Suresh Shah, Delphi (Retired) Anand Bora, Moldex 3D <b>Design and Manufacturing of Thermoplastic Composite Bipolar Plates in Proton Exchange Membrane Fuel Cells (PEMFCs)</b> Ali Manzoor, University of Toronto	Dr. Bhavesh Shah, Lion Elastomers Dr. Dave Patel, GuruTech Systems, Inc Dr. Nadeem Bokhari, Sumika Polymers NA <b>Low Compression set TPV for Dynamic Application in Automotive Industry</b> Serif Erdogan, Elastron	Dr. Petya Yaneva, SABIC Mark Allen, Dow Chemical Dr. Murali Reddy, CCC Plastics <b>Efficient Optimization of Natural Fiber Nonwoven Panels</b> Christopher Oberste, Weav3D Inc.
11:00	<b>Operational Efficiencies and Sustainability Initiatives Utilizing Color Concentrates</b> Matt Telecky, LioChem	<b>Innovative Product Designs &amp; Processing with Elastomers</b> Dr. Talat Karmo, Vintech	<b>TPO Material Preparation for Chemical Recycling</b> Robert Wahlmüller, EREMA
11:30	<b>Virtual Reality Scratch Modeling on Textured Polymeric Surfaces</b> Sumit Khatri, Texas A & M	<b>A Sustainable and Cost Effective TPV For a Better Future</b> Edgar Gonzalez, Synesis LLC	<b>A Novel Purification Method to Recycle Polypropylene, Applications to Automotive</b> – Susan Blackson, PureCycle; Katie May, Milliken

PM 12:00	<b>NETWORKING LUNCH SPONSORED BY <b>SPE DETROIT SECTION</b></b>
1:15	<b>STUDENT AWARDS</b>

1:30	<b>PANEL DISCUSSION GENERAL MOTORS</b> <b>Life Cycle Analysis – Importance, Challenges and Potential of LCA in Today's Automotive Market</b> Moderators: Matt Vandyke, General Motors; Mark Allen, Dow Panelists: Brian Leen, General Motors; Jade Beauregard, General Motors; Rachel Burland, General Motors; Shirell Klein, HRL Laboratories; Susan Kozora, IAC Group; Rob Mimms, Advanced Composites
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	NETWORKING BREAK SPONSORED BY <b>SPE DETROIT SECTION</b>		
	<b>MATERIALS DEVELOPMENT</b>	<b>EXTERIOR TRIM &amp; STRUCTURAL APPLICATIONS</b>	<b>SUSTAINABILITY</b>
2:45	Dr. Birat KC, Magna International Quentin Boll, LyondellBasell Dr. Bin Sun, SABIC <b>Application of Translucent Polyolefins in Automobile Bumper</b> Jason Li, Kingfa	Mark Pilette, Magna (Retired) Charlie Yang, LyondellBasell Kevin DeGroot, Borealis Composites, Inc. <b>Chrome-Like Effects Coatings for Exterior TPO Applications</b> Guy LaRouche General Motors Bill Coy, Mankiewicz Coatings, LLC	Dr. Petya Yaneva, SABIC Mark Allen, Dow Chemical Dr. Murali Reddy, CCC Plastics <b>Circulen Products-Solutions for Achieving your Circularity Goals</b> Dr. Ryan Breese, LyondellBasell
3:15	<b>Film Technology for Exterior TPO Parts</b> Peter Vander Ster, AkzoNobel	<b>Vehicle Crash and Energy Management Using Long Glass Fiber Polypropylene</b> Anil Tiwari, SABIC	<b>Novel Polyolefin Compounds using AirCarbon, the Biomaterial made from Methane-Based Greenhouse Gas - Yosuke Furuya,</b> Sumitomo Chemical Company; Mark Herrema, Newlight Technologies
3:45	<b>Cost-Effective Structural Polypropylene Body Panels</b> Christopher Oberste, Weav3D Inc.	<b>TPO's with Recycled Content for Fully Painted Applications</b> Tomik Mouradian, LyondellBasell	<b>Sustainable Material Pillars in the Automotive Industry</b> Rich James, Dow

	NETWORKING BREAK SPONSORED BY <b>SPE DETROIT SECTION</b>		
	<b>PROCESS ENABLING &amp; ADDITIVE TECHNOLOGIES</b>	<b>INNOVATIONS IN INTERIORS</b>	<b>POLYOLEFIN ELASTOMERS AND VULCANIZATES</b>
4:30	David Kosse, Ascend Performance Materials Dr. Suresh Shah, Delphi (Retired) Anand Bora, Moldex 3D <b>Advancing Vehicle Lightweighting Through Digital Lifecycle Modeling of TPO Foam Injection Processes</b> Pradip Sai, University of Delaware	Dr. Pravin Sitaram, Haartz Corp. Austin Wagenhals, Ford Motor Co. Hoa Pham, Sonoco <b>Integration of PCR Content in Automotive Interior Applications</b> Andrea Scantambulo, Sirmax	Dr. Bhavesh Shah, Lion Elastomers Dr. Dave Patel, GuruTech Systems, Inc Dr. Nadeem Bokhari, Sumika Polymers NA <b>PCR/PIR GP Black TPV for Under Hood Applications</b> Dr. Sassan Tarahomi, Alterra Holdings
5:00	<b>Feasibility and Potential of 3D Printing in Upcycling of Recycled Polyolefin for Sustainable Automotive Applications</b> Malik Hassan, University of Guelph	<b>New Sustainable Generation of Antimicrobial for Polyolefin</b> Dr. Mai Ha, Microban	

5:30	<b>EVENING RECEPTION SPONSORED BY <b>SPE DETROIT SECTION</b></b>
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# 2024 AGENDA

## THURSDAY 10 | 3

All Times Shown in EDT USA (UTC - 04:00)



**TPO® 2024**  
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AM 7:00

REGISTRATION / EXPO / NETWORKING / BREAKFAST

8:15

CHAIR WELCOME REMARKS / SPONSORSHIP MESSAGE

8:30

**KEYNOTE**

**OEM Perspective on TPO Industry Trends**

David Helmer, General Motors, EGM for Interior, Exterior, Information and Controls Materials Engineering

9:15

**KEYNOTE**

**Product Solutions to Enable Circularity in Automotive Interiors**

Sheila Sarver, Inteva Products, LLC, Chief Technical Officer

10:00

NETWORKING BREAK SPONSORED BY **SPE DETROIT SECTION**

HALL I

HALL II

HALL III

**MATERIALS DEVELOPMENT**

**INNOVATIONS IN INTERIORS**

**PERFORMANCE ADDITIVES & COLORANTS**

Dr. Birat KC, Magna International  
 Quentin Boll, LyondellBasell  
 Dr. Bin Sun, SABIC

Dr. Pravin Sitaram, Haartz Corp.  
 Austin Wagenhals, Ford Motor Co.  
 Hoa Pham, Sonoco

Heejung Kwon, Songwon  
 Dr. John Mara, Amfine  
 Dr. Raziye Mohammadi, Ford Motor Co

10:15

**Developed Flame-Retardant Glass Fiber Reinforced Polypropylene Compounds for EV Battery Enclosure**  
 Sho Kurimoto, Sumitomo Chemical Company

**Advantages of Injection Molding Behind Thin Film TPO**  
 David Whitehead, Inteva Products, LLC

**Novel Light Stabilizer for Polypropylene/ Thermoplastic Olefin Interior Applications**  
 Dr. Lily Liu, BASF Corporation

10:45

**Exact and Vistamaxx: Exploring the Compositional Effect on TPO Properties**  
 Brian Satterley, ExxonMobil

**Sustainable and Light-Weight Interior Ducts: New Possibilities with Ultra-Low Density PP Foams**  
 Joel Pierce, Borealis Compounds, Inc.

**Colored TPV's for Interior Applications**  
 Dr. Sassan Tarahomi, Alterra Holdings

11:15

**Next Generation Mineral Solutions for Automotive PP and TPOs**  
 Maziyar Bolourchi, IMERYS

**New Polyolefin Foams for Automotive Interior Trim Containing Sustainable Materials - Paul Sieradzki, TORAY**

**Ionic Additive to Enhance Recycled Polyolefin Materials**  
 Eric Evelhoch, Resin Solutions

11:45

NETWORKING BREAK SPONSORED BY **SPE DETROIT SECTION**

**MATERIALS DEVELOPMENT**

**INNOVATIONS IN INTERIORS**

Dr. Birat KC, Magna International  
 Quentin Boll, LyondellBasell  
 Dr. Bin Sun, SABIC

Dr. Pravin Sitaram, Haartz Corp.  
 Austin Wagenhals, Ford Motor Co.  
 Hoa Pham, Sonoco

PM 12:00

**Thermal Management of Future Battery Electrical Vehicle, Glass Reinforced PP Compounds FR Range Materials Best in Class Solutions**  
 Nicolas Schlutig, Sumika Polymer Compounds

**Mastering Variable & Recycled Feedstocks to Decarbonize Plastic Production**  
 Todd Hughes, MATERI'ACT

12:30

**Talc Modification of TPOs: The Role of Talc Fineness in Designing Final Properties**  
 Pierogiovanni Ercoli Malacari, IMI Fabi SpA

**Addressing the Circularity Challenge of the New EU End-of-Life Vehicles Regulation: Post-Consumer Recycled PP for High End Automotive Interior Applications**  
 Joel Pierce, Borealis Compounds, Inc.

1:00

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REV. 5

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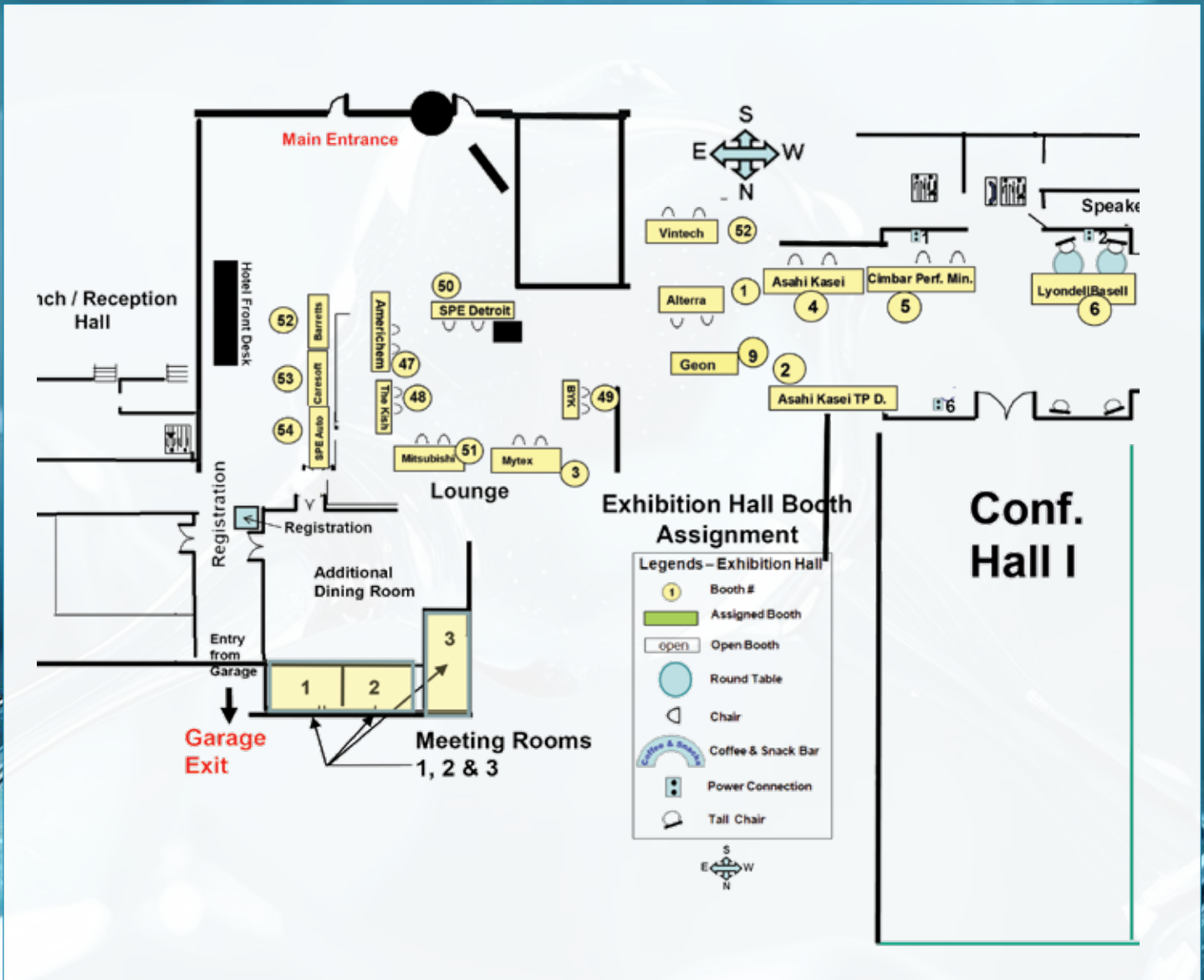
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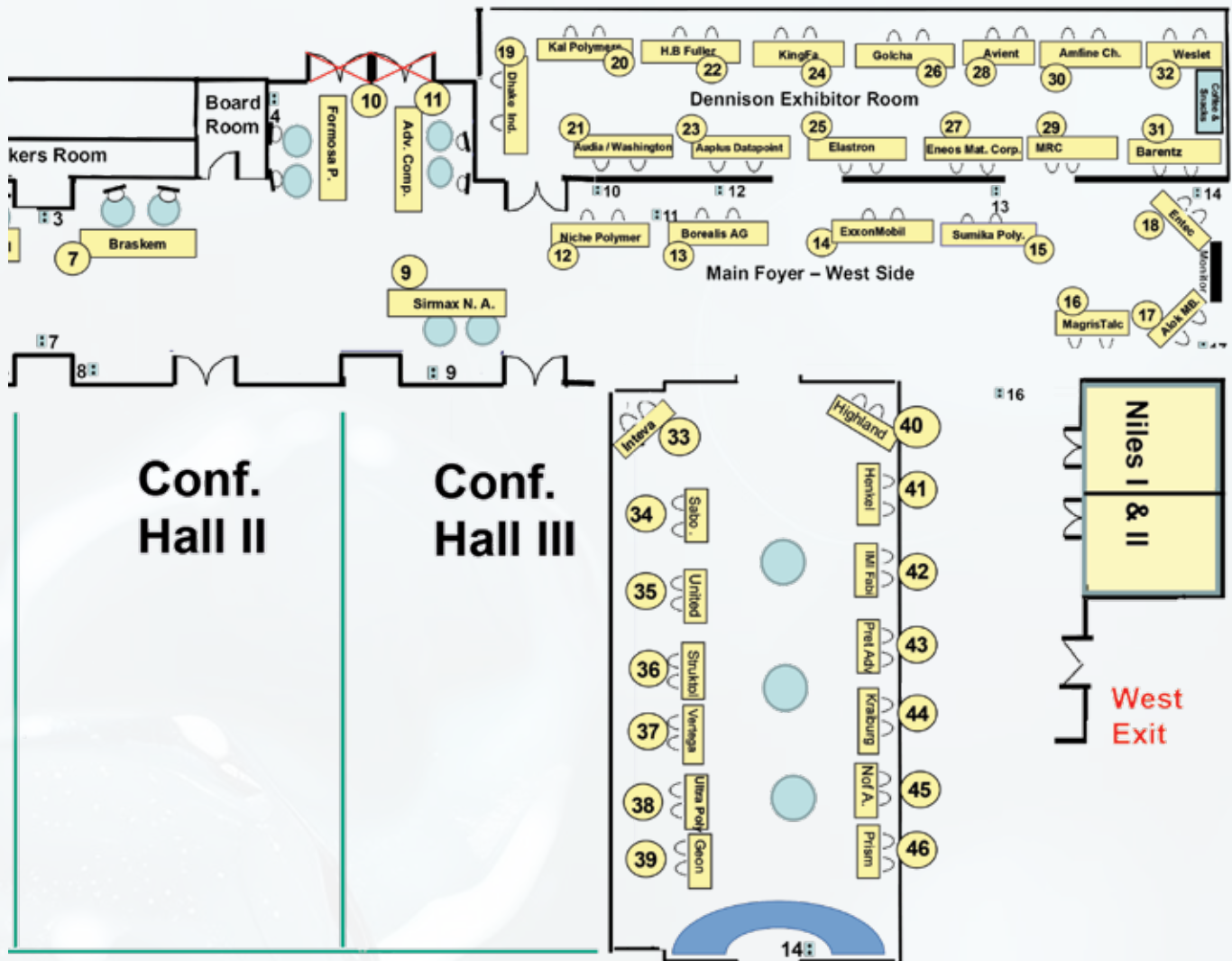
# 2024 EXHIBITOR LOCATIONS



## 2024 EXHIBITORS ALPHABETICALLY

Company	Type of Sponsor	Booth #
Advanced Composites	Platinum	11
Formosa Plastic	Platinum	10
Alok Masterbatches	Gold	17
Amfine Chemical	Gold	20
Asahi Kasei Plastics	Gold	4
Asahi Kasei Thermoplastic Elastomer Div	Gold	4
Audia Elastomers/Washington Penn	Gold	21
Avient Corporation	Gold	28
Barentz	Gold	31
Borealis (Tote Bags Sponsor)	Gold	13
Braskem	Gold	7
CIMBAR Performance Minerals	Gold	5
Dow	Gold No Booth	

ExxonMobil	Gold	14
HB Fuller	Gold	22
Inteva Products, LLC	Gold	33
Kingfa Sci. & Tech.(USA), Inc	Gold	24
LyondellBasell (Event Recordings Sponsor)	Gold	6
MRC Polymers	Gold	29
Magris Talc	Gold	16
Mitsubishi Chemical Group	Gold	52
Niche Polymer	Gold	12
PRET Advanced Materials	Gold	43
Sirmax North America, Inc (AM Monday Break)	Gold	9
Sumika Polymers NA	Gold	15
Alterra Holdings	Exhibitor	1
Americhem	Exhibitor	47



## 2024 EXHIBITORS ALPHABETICALLY

Applus DatapointLabs	Exhibitor	23	NOF America Corporation	Exhibitor	45
BYK	Exhibitor	49	Prism Worldwide	Exhibitor	46
Dhake Industries	Exhibitor	19	SABO International Americas	Exhibitor	34
Elastron	Exhibitor	25	Struktol Company of America	Exhibitor	36
Eneos Materials Corporation	Exhibitor	27	The Kish Company	Exhibitor	48
Entec Polymers	Exhibitor	18	Ultra-Poly Corporation	Exhibitor	38
GEON Performance Solutions	Exhibitor	39	United Paint & Chemical Corp.	Exhibitor	35
Golcha Minerals	Exhibitor	26	Vartega	Exhibitor	37
Henkel	Exhibitor	41	VINTECH	Exhibitor	52
Highland Plastics	Exhibitor	40	Welset Americas	Exhibitor	32
IMI Fabi LLC	Exhibitor	42	SPE Detroit	Event Sponsor	50
Kal-Polymer	Exhibitor	20	Spartan Polymers	Lanyard Sponsor	No Booth
KRAIBURG-TPE	Exhibitor	44	MHolland	Notebook Sponsor	No Booth
Mytex Polymers	Exhibitor	3			

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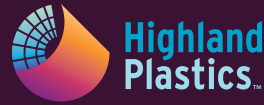


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TUESDAY, 10/1 | 9:45AM

## Automotive Sustainability Landscape and the Role of Materials in Ambition 2030 and Beyond

**BOB FLOTKOETTER**, *Director of Interior, Exterior and Seats Engineering, Nissan North America*



“Driving innovation to enrich people’s lives.” Nissan is a pioneer in electrification, launching the first mass-market EV in 2010, the Nissan LEAF, for which global sales now exceed 500,000 units. Recently, Nissan Ambition 2030 is the company’s long-term vision for empowering mobility and beyond. Responding to critical environmental, societal and customer needs, our mission is to achieve carbon neutrality and truly zero-emission vehicles by 2050, and to make electric vehicles accessible to everyone, everywhere.

Materials have always been integral to producing a profitable product that delights the customer and as the industry evolves to meet a new set of expectations, OEMs will once again look to our supply chains and in particular raw materials. While high quality, light weight and cost-effective materials have always been necessary; governments, OEMs and their customers are increasingly seeking solutions that are sustainable – be it globally abundant, ethically procured, or environmentally benign.

Nissan set the goal to achieve carbon neutrality across the company’s operations and the life cycle of its products by 2050. CO2 emissions during the production phase are one measure of sustainability to advance. In addition, the plastics community has additional challenges requiring supply chain collaboration such as limited fossil derived sources, widely varied emissions by global region and mitigation of environmental harm from plastic waste streams. Existing and new relationships and technologies must be used to bring cost down and address these challenges.

**BOB FLOTKOETTER** is director of Interior & Exterior Engineering at Nissan North America. In this role, Bob leads the teams responsible for engineering a multitude of plastic parts from Instrument Panels and Headliners to lighting and seating components, for Nissan and Infiniti vehicles manufactured in the Americas region.

Bob started his career in hybrid electric vehicle development at DaimlerChrysler, and later held systems engineering positions at Mercedes-Benz and A123 Systems. Bob joined Nissan in 2013 as an electrical engineer and advanced through multiple leadership roles in Electronics, Batteries, Thermal components and most recently Interior and Exterior Trims.

Bob holds electrical engineering and MBA degrees from Michigan State University and an electrical engineering master’s degree from the University of Michigan. He lives in Novi, Michigan, with his wife and three sons, where his additional roles include husband, father, coach, amateur sailboat racer and avid mountain biker.

TUESDAY, 10/1 | 1:30PM

## Predicting the Future of Automotive Interior Surfaces by Looking Back in Time

**JEFFREY STOUT**, *Executive Director of Advanced Business Development, Yanfeng*



From steel instrument panels a half century ago to the current executions of high tech interior materials, interiors continue to evolve in response to the dramatic changes taking place in the global automotive market place. All OEM producers and their suppliers, from tier one down to raw material providers, are continuously developing newer solutions to meet the needs of this new marketplace. Yanfeng as a tier one, is also developing material, process and architecture solutions to meet these future needs. As we look forward to ‘the next’ technologies, it’s always helpful to look back at how we got here to understand the trajectory of the path ahead and how these new technologies will help resolve existing issues in the future marketplace.

**JEFFREY STOUT** is Executive Director, Global Advanced Business Development. Prior to this appointment, Stout was Executive Director, North America Innovation and New Mobility for Yanfeng Automotive. Jeff began his professional career with Johnson Controls in 1994 as a Product Engineer. At Johnson Controls, he held a variety of leadership roles in Engineering and Innovation, including an expat assignment in China for 3 years.

He earned a Bachelor of Science degree in Mechanical Engineering and a Bachelor of Arts degree in Philosophy. He also holds a Master of Science degree in Engineering Leadership.

# 2024 KEYNOTES



WEDNESDAY, 10/2 | 8:30AM



## Value Chain Collaboration, Key to a Successful Circular Economy for Plastics

**LINDA WRIGHT, Vice President of Product Solutions Technology, ExxonMobil**

Across the automotive value chain, interest in and demand for solutions that can deliver sustainability and performance benefits is growing. Solutions at scale will need to be paired with technology development to enable meaningful collaboration within the polymers industry. ExxonMobil is creating solutions that can help enable sustainability benefits to help improve quality of life and meet society's evolving needs. This presentation will highlight Extend™ technology for advanced recycling and discuss the incorporation of certified-circular polymers which can help support the automotive value chain's plastic circularity goals.

**LINDA WRIGHT** As the Vice President of Product Solutions Technology Portfolio, Linda oversees a team dedicated to creating technology solutions that meet societal needs and customer ambitions, ultimately contributing to the technology advances essential to the energy transition.

Throughout her career she has actively sponsored technology as a strategic business asset in the petroleum and petrochemical industry. Linda has held a wide range of positions during 30+ years with ExxonMobil, including business strategy, technology, marketing, business development, planning, supply and operations.

Linda received a Bachelor of Science in Chemical Engineering from the University of Missouri-Rolla.

THURSDAY, 10/13 | 8:30AM



## OEM Perspective on TPO Industry Trends

**DAVID HELMER, EGM for Interior, Exterior, Information and Controls Materials Engineering, General Motors**



Thermoplastic polyolefin materials such as polyethylene and polypropylene blends have become the most widely used polymer by mass in automotive. Over the years, the thermoplastic polyolefin trend has been to replace engineering plastics as well as metals more and more due to cost, mass, and property improvements. As the pace of change accelerates, automotive trends will be presented that effect thermoplastic polyolefin future usage. Large trend drivers include sustainability, CAE, mass, cost, design, electric vehicles, autonomous vehicles, etc.

**DAVID HELMER** obtained his BS in Material Science and Engineering from University of Michigan (1995), MS in Engineering from Rensselaer Polytechnic Institute (2000), and MBA from Indiana University (2006). David has 25+ of years of experience at General Motors supporting material selection and currently the Engineering Group Manager for Interior, Exterior, Information and Controls Materials Engineering.

TUESDAY, 10/1 | 9:15AM



## Product Solutions to Enable Circularity in Automotive Interiors

**SHEILA SARVER, Chief Technical Officer, Inteva Products, LLC**



Automotive OEMs have committed to producing lower-impact products by transitioning away from internal combustion engines (ICE), eliminating ~65% of a vehicle's carbon footprint in the form of tailpipe emissions. Adopting lower-impact materials and processes are necessary to affect a future carbon hotspot of BEVs: vehicle manufacturing. Several low-impact materials and products are available, including bio-based or advanced recycled, but often these demand an unsustainable price. Thermoplastic polyolefins (TPOs) are cost-effective, low-impact, and aligned with automotive circularity. Inteather™ Foam Eco is a new product, in production since 2020, that offers a significantly lower product footprint and enables a premium mono-material assembly concept to support automotive circularity. Recognized as a customer-driven global automotive supplier, Inteva is focused on including sustainability in the product design process.

**SHEILA SARVER** is the Chief Technical Officer at Inteva Products and is responsible for leading significant technology transformations across Inteva's global product offerings: Interior Systems, Closure Systems, and Motors & Electronics. In addition to the many engineering solutions, technology transformations, strategic quality initiatives, and digitalization implemented over her career, she has also been widely recognized for building high performance cultures and technical teams. Sheila has over 20 years of global engineering experience and, most recently, served as Vice President – Americas Engineering at Otis Worldwide Corporation prior to joining Inteva Products earlier this year.

# 25<sup>TH</sup> ANNIVERSARY FOUNDERS ROUND TABLE

How the TPO Conference Started, Growth of TPO in Automotive, and Perspectives on the Future

TUESDAY, 10/1 | 8:30AM

## FOUNDERS



**ROSE RYNTZ**  
Ryntz & Associates



**NORM KAKARALA**  
Inteva Products, LLC  
(Retired)



**ROBERT ELLER**  
Robert Eller Associates



**BILL WINDSCHEIF**  
Advanced Innovative  
Solutions, Ltd.



## MODERATORS

**MARK LAPAIN**, *Advanced Composites*  
**NEIL FUENMAYOR**, *LyondellBasell (Retired)*

# PANEL DISCUSSION - LIFE CYCLE ANALYSIS

Importance, Challenges and Potential of LCA  
in Today's Automotive Market

WEDNESDAY, 10/2 | 1:30PM

LED BY



## PANELISTS



**BRIAN LEEN**  
General Motors



**JADE BEAUREGARD**  
General Motors



**RACHEL BURLAND**  
General Motors



**SHIRELL KLEIN**  
HRL Laboratories



**SUSAN KOZORA**  
IAC Group



**ROB MIMMS**  
Advanced Composites



## MODERATORS

**MATT VANDYKE**, *General Motors, Senior Plastics Sustainable Materials Engineer*  
**MARK ALLEN**, *Dow, Senior TS&D Scientist for Mobility Interior Materials*

# HYUNDAI PLENARY DISCUSSION

## Strategic Materials Development – Achieving Carbon Neutrality Goals through Enhanced Product Sustainability

WEDNESDAY, 10/2 | 9:15AM



### DREW GEDA

Senior Polymer Materials Development Engineer,  
Interior Plastic - Strategic Materials  
Hyundai-Kia America Technical Center, Inc.,  
Hyundai Motor Group

Material sustainability has become one of the most critical R&D areas of focus within the automotive industry. Every segment within the value chain is beginning to adopt ambitious carbon neutrality goals that stretch out for the next two and a half decades. This presentation will detail how Hyundai/Kia is strategizing in consideration our own goals, as well as what steps we have already taken towards realizing them.

There are many examples of successful sustainable material development efforts in the interior spaces of our vehicles today, and there are many projects that are ongoing. We will review some of these innovative material solutions as a part of this presentation and look towards longer-term research objectives on our pathway towards net-zero carbon neutrality in our vehicles and operations by 2045.

Lastly, we plan to discuss the many challenges that have been encountered as we continue to strive for broader adoption of recycled and renewable materials, as well as what challenges we anticipate on the horizon.

### Q&A PANELISTS

#### ANGELO DILISIO

Hyundai-Kia America  
Technical Center, Inc.,  
Hyundai Motor Group

#### ISABEL NEWTON

Hyundai-Kia America  
Technical Center, Inc.,  
Hyundai Motor Group

#### JEFFREY WENY

Hyundai-Kia America  
Technical Center, Inc.,  
Hyundai Motor Group



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# 2024 SPE TPO STUDENT POSTER COMPETITION

## SUPPORTING SCIENTISTS OF TOMORROW

Students from Ecotek Lab - a Detroit-based research and innovation organization dedicated to supporting the scientists of tomorrow - will present their plastic research projects in a Technical Project Poster Competition at the 2024 SPE TPO Global Automotive Conference. We are expecting 30+ students from Ecotek Lab to join us at our 25th Anniversary Conference, with many students showcasing their material projects in the competition. These young scientists are academically gifted middle and high school students who participate in international science research ventures.



Ecotek Lab, based in TechTown Detroit helps children develop and nurture scientific and critical thinking skills. Founded in Detroit in 2005 by Keith Young, Ecotek Lab reaches over 4,000 Michigan kids annually, preparing them for leadership roles. Today, Ecotek Lab has grown outside of Michigan, to also include Florida and Maryland, and true to its motto - Science at Work - has enabled 15 start-up companies with some former students in leadership positions.

### WEDNESDAY, OCTOBER 2

**9:00 - 11:00AM / 12:00 - 4:00PM**

**POSTERS DISPLAYED IN HALLWAYS**

**11:00AM - 12:00PM**

**COMMITTEE JUDGING - NILES I & II**

**1:15-1:30PM**

**AWARD WINNERS ANNOUNCED - HALLS I-II-III**

### AWARDS

**1<sup>ST</sup> PLACE \$1,000 | 2<sup>ND</sup> PLACE \$750**

**3<sup>RD</sup> PLACE \$500 | ATTENDEE CHOICE \$500**



Keith Young,  
 Founder, CEO  
 Ecotek Lab



Ecotek Lab: Keith Young at [ecoteklab@gmail.com](mailto:ecoteklab@gmail.com)

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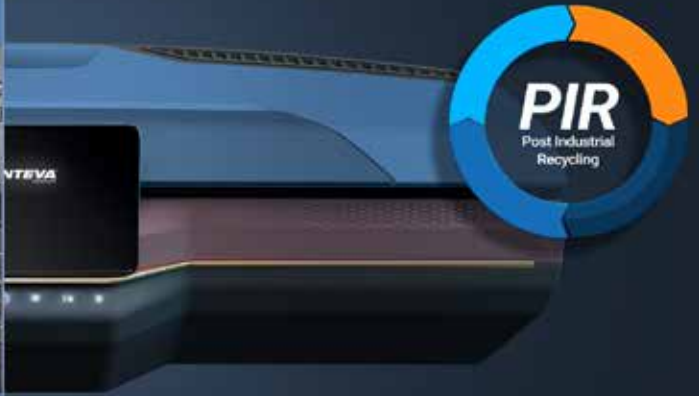


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# MATERIALS DEVELOPMENT

SESSION CO-CHAIRS: Dr. Birat KC, *Magna International*  
Quentin Boll, *LyondellBasell* | Dr. Bin Sun, *SABIC*



## THE EVOLUTION OF THERMOPLASTIC POLYOLEFIN (TPO) IMPACT MODIFICATION FOR AUTOMOTIVE APPLICATIONS

Mark Jablonka, *Dow*

For the past 3 decades, the use of thermoplastic polyolefins (TPOs) in automotive has continued to grow driven by the need to reduce vehicle weight, improve aerodynamics, and meet consumer styling preferences. Impact modifiers have played a critical role enabling this growth by improving TPO durability while also reducing thermal expansion and enabling flow into complex geometries. This presentation will review the evolution of TPO impact modifiers highlighting key milestones leading to TPOs becoming the most desired thermoplastic used in automobiles today.



## PROPOSAL OF CORE BACK FOAMED INTERIOR ACHIEVED BY HIGH FLOW SEBS

Kazuhisa Takagi, *Asahi Kasei*

Asahi Kasei is a world leading supplier of innovative hydrogenated styrenic thermoplastic elastomers (SEBS: TUFTEC™ and S.O.E.™). In this session, we will introduce S.O.E.™ unique SEBS grades suitable for obtaining soft touch surface, abrasion resistance, and vibration damping properties which are required for automotive interior parts. Especially this time, we will introduce the newly developed S.O.E.™ for automotive interior materials, enabling skin and foam layer to be molded all together all at once, whereby reducing the production process and material waste.



## REINFORCED POLYPROPYLENE (PP) FOR SPECIALTY AND STRUCTURAL APPLICATIONS

Tariq Syed, *SABIC*

Fillers are inert substances typically added to optimize product cost and improve the mechanical properties of plastic matrices. Reinforcement, a subset of fillers, distinguishes itself by noticeably improving tensile strength, largely due to its higher aspect ratio. Commonly taking the form of fibers, reinforcements can be chopped or continuous and used in woven or nonwoven fabrics for composite manufacturing. Glass fibers dominate the reinforcement market, characterized by their varied chemical compositions. By combining glass fiber with a polymeric matrix and other additives, composites are tailored to meet specific requirements across various applications.



## APPLICATION OF TRANSLUCENT POLYOLEFINS IN AUTOMOTIVE BUMPER

Jason Li, *Kingfa*

The market share of new energy vehicles has risen greatly in the past two years, and there are more and more requirements for intelligence, science and technology. For a more modern design, there is a need for the use of translucent materials. After the new energy vehicle grille is removed, the front fascia can achieve functional design, such as the lighting effect, which is currently achieved by PC spraying which laser carving. There are problems such as high cost, high density, poor weather resistance, etc. Translucent Polyolefin has been considered more because of its advantages such as low density, excellent weather resistance, good formability, and good radar wave transmittance.



## FILM TECHNOLOGY FOR EXTERIOR TPO PARTS

Peter Vander Ster, *AkzoNobel*

For many years, film technology has been used to decorate interior automotive parts. Functional aspects like printed electronics have been added in recent years. In this presentation, AkzoNobel will review what film technology can be used - and what benefits they offer - to decorate exterior automotive parts based on polyolefins compared to traditional technologies like liquid paint and / or chrome plating.

# MATERIALS DEVELOPMENT

SESSION CO-CHAIRS: Dr. Birat KC, *Magna International*  
Quentin Boll, *LyondellBasell* | Dr. Bin Sun, *SABIC*



## COST-EFFECTIVE STRUCTURAL POLYPROPYLENE BODY PANELS

Christopher Oberste, *Weav3D Inc.*

In partnership between WEAV3D, Braskem, Altair, and the Clemson Composites Center, an automotive door structure originally developed in carbon fiber/PA6 organosheet was redesigned in polypropylene using WEAV3D's innovative hybrid-material composite lattice reinforcements. This highly optimized structure achieved 20% weight savings and 50% cost savings vs. the original organosheet, while also reducing trim scrap mass by 63%. In this presentation, a case study covering design, manufacturing, and testing of this innovative thermoplastic composite structure will be presented, with particular emphasis on the benefits of polypropylene for improved toughness and recovery after deformation when compared to both organosheet and steel. Preliminary data for an ongoing recycling pathway study using offcuts from the beltline forming process will also be presented.



## DEVELOPED FLAME-RETARDANT GLASS FIBER REINFORCED POLYPROPYLENE COMPOUNDS FOR EV BATTERY ENCLOSURE

Sho Kurimoto,  
*Sumitomo Chemical Company*

Sumitomo Chemical is committed to provide technology solutions to enhance the comfort level and secure the optimal safety to the automotive industry by continuously developing novel materials through exploring new ways. We have developed novel Thermofil FR<sup>®</sup> for EV Battery Enclosure. Thermofil FR<sup>®</sup> is Flame-Retardant Glass Fiber Reinforced Polypropylene Compounds with high modulus and good injection-moldability.



## EXACT™ AND VISTAMAXX™: EXPLORING THE COMPOSITIONAL EFFECT ON TPO PROPERTIES

Brian Satterley  
*ExxonMobil Technology and Engineering Company*

Exact™ polyolefin elastomers (POE) are one of the first metallocene ethylene alpha-olefin copolymers produced in the market. These POE have a wide range of densities between 0.862 to 0.902 and melt index between 0.5 to 30 and are copolymers of butene, hexene or octene. One of the main applications for ethylene elastomers is the impact modification of polypropylene resins in thermoplastic olefin (TPO) compounds. Although literature exists on the utility of POE to improve mechanical properties and impact toughness at different temperatures, there is still a need for an understanding how changes in elastomeric composition affect performance in TPO compounds.

The addition of recyclate streams to TPO compounds is increasingly being pursued with the need to maintain properties. The use of Vistamaxx performance polymers and Exact POE in a mixed recyclate stream (PP and PE) and the effect of compatibilization on the properties of the TPO compound that incorporates recyclates is explored. This presentation will aim to enhance the understanding of the toughening mechanism from an elastomeric component perspective and draw a structure-property relationship for a model TPO compound.

# MATERIALS DEVELOPMENT

SESSION CO-CHAIRS: Dr. Birat KC, *Magna International*  
Quentin Boll, *LyondellBasell* | Dr. Bin Sun, *SABIC*



## NEXT GENERATION MINERAL SOLUTIONS FOR AUTOMOTIVE PP AND TPOS

Mazyar Bolourchi, *IMERYS Performance Additives, North America*

Imerys is introducing a new set of highly reinforcing mineral solutions designed for a range of automotive applications, including PP and TPO parts. In this paper, we will cover new mineral solutions that have been developed to address lightweighting, dimensional stability, translucency, flame retardancy and sustainability needs. Experimental data will be presented in automotive formulations showcasing these attributes and benefits.



## THERMAL MANAGEMENT OF FUTURE BATTERY ELECTRICAL VEHICLE, GLASS REINFORCED PP COMPOUNDS FR RANGE MATERIAL BEST IN CLASS SOLUTIONS

Nicolas Schlutig, *Sumika Polymer Compounds*

Automotive sector is starting to make a new revolution to achieve Carbon neutrality in 2050. Battery electric vehicle (BEV) is one of the solutions, but good operation of batteries and the prevention of any thermal runaway is a key point. This presentation compares different solutions provided by Sumika Polymer Compounds EUROPE to well manage cooling of different component and sub-component of the battery pack. Some technical solutions using Flame retardant GFPP THERMOFIL FR®, will be deeply presented to avoid any fire expansion inside the battery pack.



## TALC MODIFICATION OF TPOS: THE ROLE OF TALC FINENESS IN DESIGNING FINAL PROPERTIES

Piergiovanni Ercoli Malacari, *IMI Fabi Spa*

Talc modification of polyolefins and TPOs is a common practice in automotive industry, but how to select the right talc grade for the desired performance? Current applications are ranging from highly talc filled polyolefins to ones intended for lightweighting compounds, where the talc loading is minimal. How to select the right talc product and what to expect in terms of processability as talc volume can represent an issue in standard feeding conditions. A review of talc performances in polyolefins and TPOs will be done, in combination with talc feeding conditions and possible solutions to overcome feeding problems. The latest proposals of IMI Fabi to approach the most demanding requirements in automotive formulations from lightweighting to translucent TPOs will be discussed, providing an overview of the possible solutions to design TPOs with talc.

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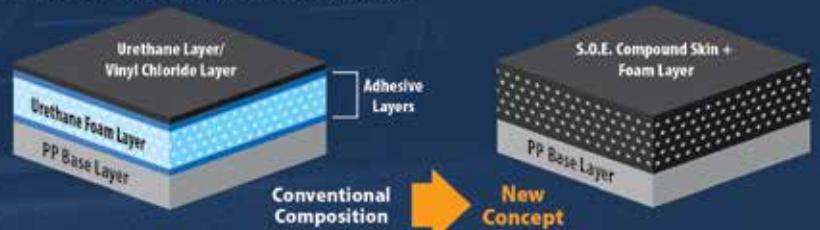
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# PROCESS ENABLING & ADDITIVE TECHNOLOGIES

SESSION CO-CHAIRS: David Kosse, *Ascend Performance Materials*  
Dr. Suresh Shah, *Delphi (Retired)* | Anand Bora, *Moldex 3D*



## HOW TO PREDICT FLOW-INDUCED SURFACE DEFECTS

Alex Bake, *Moldex 3D*

This discussion delves into the intricacies of predicting and analyzing flow-induced surface defects in injection molding processes. It provides a comprehensive exploration of the causes and mitigation strategies for common defects such as stress marks, weld lines, sink marks, and more. Special emphasis is placed on the viscoelastic effects on materials and how these impact the occurrence and severity of these defects.

Detailed case studies, including the analysis of “tiger stripes” and other cosmetic defects associated with valve gating are reviewed. By integrating Moldex3D’s advanced simulation capabilities, the presentation explores how temperature, pressure, residual stresses, and part geometry contribute to defect formation. Practical demonstrations through Design of Experiments (DOE) highlight the application of simulation technology to predict and prevent these unwanted outcomes effectively.



## TAILORING RIGIDITY IN POWDER MELT EXTRUSION 3D PRINTING OF RECYCLED POLYOLEFINS

Xinyu (Jerry) Miao,  
*University of Wisconsin, Madison*

This presentation outlines innovative strides in the additive manufacturing domain, focusing on the development and application of an open-source Powder Melt Extrusion (PME) 3D printer designed to optimize the use of recycled polyolefins. Our research addresses the limited utilization of polyolefins in 3D printing despite their extensive industrial applications and recycling potential. We explore the mechanical property manipulation of 3D-printed objects through real-time adjustments during the printing process.

We designed and validated a dual-material PME 3D printer capable of in-line blending and extruding recycled polyolefin powders. By adjusting parameters such as feedstock composition and processing parameters, we dynamically altered the rigidity of printed objects. This approach enables the production of parts with tailored mechanical properties without pre-compounding, promoting efficient material use and sustainability.



## NEXT CHAPTER IN AI COMPOUNDING

Dr. Arash Kiani, *Alterra Holdings*

Alterra has been compounding with the aid of AI in the past five years. SmartChronos the AI software invented by Dr. Kiani has gone through several revisions of raw material control, process optimization, testing and finished goods packaging. The latest SmartChronos dashboard updates will be reviewed in this presentation. Dr. Kiani will present how Alterra is succeeding with the AI, “SmartChronos” compounding where others have not yet considered AI for their compounding plant.



## DESIGN AND MANUFACTURING THERMOPLASTIC COMPOSITE BIPOLAR PLATES IN PROTON EXCHANGE MEMBRANE FUEL CELLS (PEMFC'S)

Ali Manzoor, *University of Toronto*

There have been a wide range of technologies that have gained attention in the automotive industry specifically, particularly Proton Exchange Membrane Fuel Cells (PEMFCs). Since only up to 1V can pass through an individual PEMFC, these individual cells are stacked in series and separated by the bipolar plate. The bipolar plate must be electrically and thermally conductive, mechanically robust and be chemically resistive due to the environment of a PEMFC. Metallic bipolar plates have poor chemical resistance and non-porous graphite bipolar plates have exceptional low mechanical properties. Therefore, attention has been dedicated to thermoplastic composites.

# PROCESS ENABLING & ADDITIVE TECHNOLOGIES

SESSION CO-CHAIRS: David Kosse, *Ascend Performance Materials*  
Dr. Suresh Shah, *Delphi (Retired)* | Anand Bora, *Moldex 3D*



## OPERATIONAL EFFICIENCIES AND SUSTAINABILITY INITIATIVES UTILIZING COLOR CONCENTRATES

**Matt Telecky, *LioChem***

Material cost and perceived simplicity of process are often the overriding factors in selection of precolor vs. DIY Natural + Color Concentrates for automotive injection molding processes. Further, with the cost transparency that the OEMs are expecting of the supply chain, any material savings that might be captured by utilizing color concentrates is often shared with the OEM in a formal VAVE process. This often discourages the pursuit of natural + color concentrates and it is “what we see” in objective hard costs. In this presentation, we will explore both manufacturing efficiencies AND sustainability initiatives utilizing color-at-press along with bulk delivery of the natural polymer. When the enterprise looks beyond the material costs, often the magnitude of savings in different departments of the operation far outweighs the transparent purchased material inputs. Many departments and stakeholders will recognize the benefit improving the overall efficiency and competitiveness of the organization. This is “what we overlook” and will be the emphasis of the presentation.



## VIRTUAL REALITY SCRATCH MODELING ON TEXTURED POLYMERIC SURFACES

**Sumit Khatri, *Texas A&M***

Surface texturing has been widely utilized to improve scratch visibility resistance through unique texture masking properties. Textures reduce the contact area with the scratch tip, resulting in lower friction and better scratch performance. Additionally, even if a textured surface is scratched, texture grains mask the appearance of a scratch. The effectiveness of texture in scratch resistance and masking depends on a variety of factors like grain size, shape, height, and distribution. Traditionally, such an issue is handled by designing expensive molds followed by sample preparation, scratch testing and analysis. In this study, we have implemented a virtual scratch analysis scheme powered by finite element modeling and virtual reality. This approach essentially creates a digital twin of a scratch on a textured surface dealing with not only surface deformation but the appearance of scratch as well. A parametric study was carried out based on the texture size and height to determine the relative importance of each parameter. Implication of the present study on effective choices of material and surface texture design is discussed.



## ADVANCING VEHICLE LIGHTWEIGHTING THROUGH DIGITAL LIFECYCLE MODELING OF TPO FOAM INJECTION PROCESSES

**Pradip Sai, *University of Delaware Center for Composite Materials***

Reducing vehicle weight is crucial for improving efficiency and sustainability in the automotive industry. Thermoplastic olefins (TPOs) are particularly significant due to their versatility and the substantial weight savings they offer when used in manufacturing automotive components. Our research enhances the application of TPOs by utilizing supercritical nitrogen as a physical foaming agent, which surpasses the limitations of traditional chemical foaming agents. We've combined experimental data with simulations to develop detailed Material-Process-Microstructure-Performance (MP2) relationships, aiming for a 5–20% reduction in material weight.

This study not only highlights the benefits of physical foaming agents for enhancing TPOs but also emphasizes the importance of combining experimental and simulation methods to effectively capture the foaming process and establish robust MP2 relationships.



## FEASIBILITY AND POTENTIAL OF 3D PRINTING IN UPCYCLING OF RECYCLED POLYOLEFIN FOR SUSTAINABLE AUTOMOTIVE APPLICATIONS

**Malik Hassan, *University of Guelph***

This study explores the feasibility of fused deposition modeling (FDM), a 3D printing technique, for the upcycling of ocean-recycled polyolefins and biomass waste for sustainable automotive applications. The printing parameters were optimized for improved mechanical performance using Taguchi-Gray relational analysis. The optimal parameters for the rHDPE-rPP blend and rHDPE-rPP-biocarbon composite resulted in significant improvements in mechanical performance. This research advances 3D printing technology and promotes sustainability by valorizing waste as viable FDM materials, thus supporting circular economy principles in automotive parts production.

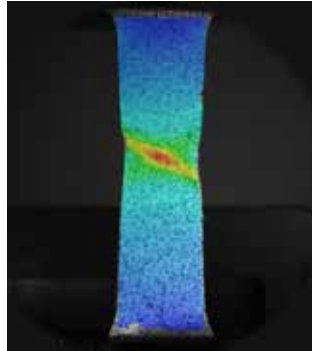
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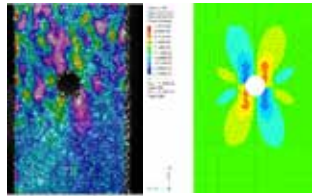
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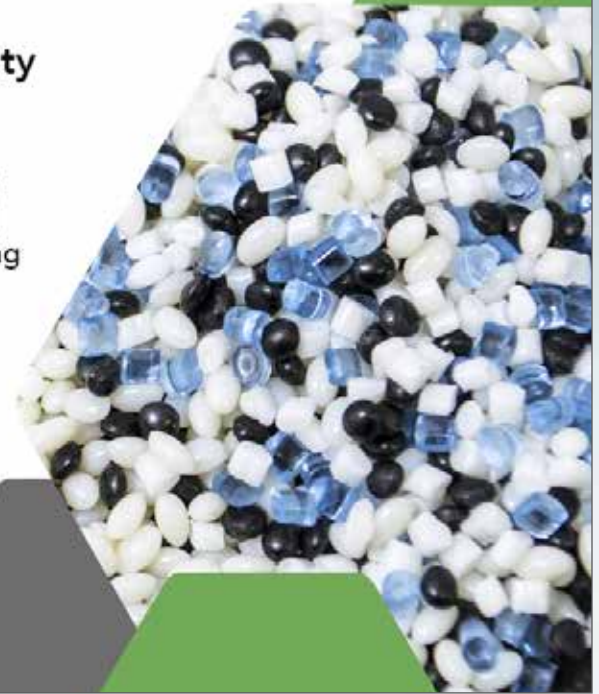


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# POLYOLEFIN ELASTOMERS AND VULCANIZATES

SESSION CO-CHAIRS: Dr. Bhavesh Shah, *Lion Elastomers*

Dr. Dave Patel, *GuruTech Systems, Inc* | Dr. Nadeem Bokhari, *Sumika Polymers NA*



## SARLINK® TPV: POWERING SUSTAINABLE AUTOMOTIVE INNOVATION

Pratik Shah, *Teknor Apex*

The automotive industry demands high-performance, sustainable materials. Sarlink® TPV rises to the challenge, surpassing the traditional option of EPDM rubber and new TPE alloys in long-term vehicle sealing performance. At its core, Sarlink® TPV boasts a unique material composition that unlocks unmatched elastomeric properties, making it the ideal choice for fluid management in complex EV thermal systems. This presentation explores the role of Sarlink® TPV in sustainable automotive design, highlighting its low environmental impact, advancements in recycled content integration and new designs enabled by advanced foaming technology – all without sacrificing performance.



## DESIGNING TRANSLUCENT TPO FOR PERFORMANCE AND END-OF-LIFE RECYCLABILITY

Dr. Raja Dharmarajan, *Kraton*

The growth of electric and autonomous vehicles is rapidly changing the automotive industry, injecting creativity and endless possibilities into exterior and interior design. OEMs and suppliers are designing innovative parts that are aesthetically pleasing, re-engineered for simplicity and increasingly focused on Sustainability. Translucent TPO is enabling designers and engineers to reimagine bumper fascia and interior trim by incorporating back-lighting, streamlining manufacturing and helping OEM's meet recyclability goals for end-of-life (EOL) vehicles. This presentation will highlight the sustainability advantages of TPO and share best-practices to optimize both transparency and impact-resistance with the help of Kraton styrenic block copolymers (SBC's).



## SANTOPRENE® TPV FOR AUTOMOTIVE DYNAMIC SEALS

Abdul Janga, *Celanese*

Santoprene TPV-based sealing systems continue to grow and offer advantages compared to conventional EPDM thermoset-based sealing systems. This presentation covers the development of the new soft, foamable Santoprene® TPV for primary and secondary body sealing applications as a viable solution for sustainability and weight reduction for all types of vehicles, including ICE (internal combustion engine) and EV (electric vehicles). Their key performance features and foaming characteristics will be discussed.



## LOW COMPRESSION SET TPV FOR DYNAMIC APPLICATION IN AUTOMOTIVE INDUSTRY

Serif Erdogan, *Elastron*

This presentation will highlight a new thermoplastic vulcanizate (TPV) material developed through long-term research experience with EPDM/PP-based TPVs. The newly developed material offers a Lower Compression Set, Higher Mechanical Properties and good Weathering Resistance, making it ideal for use in Dynamic Seal applications for window and door systems. This innovative TPV boasts numerous advantages, including good elastic recovery, easy processing and lower emission, better weathering resistance and lower CO2 emissions compared to Thermoset Rubbers.

# POLYOLEFIN ELASTOMERS AND VULCANIZATES

SESSION CO-CHAIRS: Dr. Bhavesh Shah, *Lion Elastomers*

Dr. Dave Patel, *GuruTech Systems, Inc* | Dr. Nadeem Bokhari, *Sumika Polymers NA*



## INNOVATIVE PRODUCT DESIGNS & PROCESSING WITH ELASTOMERS

Dr. Talat Karmo, *Vintech Industries*

Innovative product designs and processing of several elastomers and vulcanizates resulted in new applications primarily for OEMs. Vintech Industries has pioneered many such applications like pinch sensors, lighting, integrated extruded plastic fasteners, foam like honeycomb extrusions, hybrid running boards and TPVs with integral slip coats.

Integrated electronics such as pinch sensors and lighting for running boards and other exterior trim are discussed in detail. Also featured is a multi-material elastomer coextruded seal with honeycomb shape and integral clips that was developed to eliminate foaming operation and purchased fasteners.



## A SUSTAINABLE AND COST EFFECTIVE TPV FOR A BETTER FUTURE

Edgar Gonzalez, *Synesis LLC*

OEMs are working to increase the use of recycled content materials and reduce waste to achieve a more sustainable future. Methods have long been sought to utilize waste thermoset rubber products in such a way that an optimum is obtained between as low as possible cost to produce on the one hand and technical applications of the highest possible quality on the other hand.

In this presentation, three application case studies are described where a recycled rubber based thermoplastic elastomer, ECO-FLEX RTPV, replaced virgin thermoset rubbers by combining the performance characteristics of rubber, such as flexibility and wear resistance, with the processing ease of conventional thermoplastic materials while delivering cost savings and increasing the sustainable content of the OEMs end products.



## PCR/PIR GP BLACK TPV FOR UNDER HOOD APPLICATIONS

Dr. Sassan Tarahomi,  
CTO *Alterra Holdings*

With the introduction of Hybrid and Electric Vehicles new under hood applications of PCR/PIR general purpose TPV are emerging. Lightweighting and sustainability of these new emerging TPV components are key to their successful design, development, and launch. This presentation focuses on Under hood, trunk trim and underbody parts that can be converted to a PCR/PIT general purpose black TPV.

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# INNOVATIONS IN INTERIORS

SESSION CO-CHAIRS: Dr. Pravin Sitaram, *Haartz Corp.*  
Hoa Pham, *Sonoco* | Austin Wagenhals, *Ford Motor Co.*



## SOFT TPO (THERMOPLASTIC OLEFIN) FOAM BI-LAMINATE FOR SCORELESS APPLICATIONS

Joshua Cram, *Continental*

Thermoplastic Olefin films are commonly used in automotive interior component production, utilizing processes like positive vacuum forming, in-mold graining, and exact shape lamination. Historically, textile-based laminates like Polyvinyl Chloride or Polyurethane artificial leather are used for producing components with decorative or functional seams. With such seams giving the appearance of “High Quality.” Current Thermoplastic Olefin top films utilized for scoreless applications are hard, plastic-like and have high energy requirements to tear cleanly. This results in incomplete and jagged tears along airbag openings. To overcome these disadvantages, a newly developed soft, flexible, and sewable laminate has been introduced that requires lower energy to tear cleanly and completely. It is suitable for scoreless/unweakened airbag openings and eliminates the airbag door read-through generated from current scoring methods, as well as the additional processing steps, cost, and time associated with such methods.



## DESIGN FOR SUSTAINABILITY & RECYCLING ON INTERIOR PARTS

Ryan Case, *Antolin*

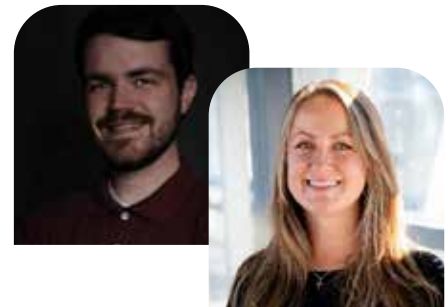
Antolin, deeply dedicated to ESG targets, champions a multitude of sustainability initiatives, broadening its focus beyond green energy consumption to encompass sustainable materials, products, and processes within the automotive sector. Pioneering multiple design and innovation lines with a sustainability-centric approach, the company aims to revolutionize the industry by introducing advanced solutions like recycled and circular coverings, thereby fortifying its role as a trailblazer in the sustainable automotive innovation market space.



## MAKING YOUR INSTRUMENT PANEL OR DOOR PANEL AN ALL-OLEFIN MONO-MATERIAL

Mark Helder, *Haartz*

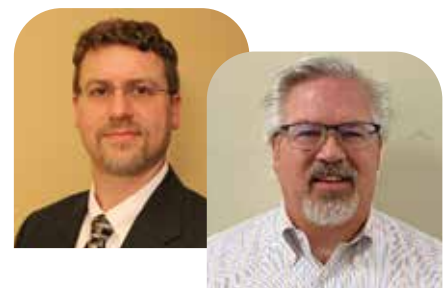
Pre-applied adhesive for molded automotive interior trim has long been discussed and sought-after, but to this point little used. In this presentation, we'll take a deeper look at the requirements and design goals for pre-applied adhesives for use in NVF-IMGL and MVF doors and instrument panels, and highlight some of the challenges that have limited adoption of this process technology. Finally, we will introduce a product worthy of adoption in the marketplace, with a key benefit --- interior trim components that are completely olefinic mono-materials --- much preferred for in-process trim and end-of-life recycling.



## INTERIOR PCR MATERIAL WITH ENHANCED IMPACT & PROCESSABILITY

Ben McComb, *Advanced Composites*  
Ewa Lebert, *General Motors*

To help meet upcoming sustainable targets, this material with post-consumer recycle content was developed to meet a wider range of automotive interior applications, including door panels. This PCR grade has improved impact resistance, processability and is more resistant to tiger striping. The consistency of the PCR feed stream was an important factor during the development of the material and has resulted in a final product that has a good balance of physical properties and lot-to-lot consistency.



## SINGLE SIDE LAMINATION ADHESIVE FOR INTERIOR TRIM

Brent Landis/Rick Snyder, *H.B. Fuller*

Automotive interiors continue to evolve with more upscale designs to meet the expectations of customers who are thinking about their cars are their third space. Manufacturers are pushing for a more premium feel while also trying to balance the costs associated with these impressive interior features. At the same time the quality requirements continue to increase. H.B. Fuller has launched its new Thermonex® ONE product line to facilitate lower process costs and higher quality output. Thermonex®

# INNOVATIONS IN INTERIORS

SESSION CO-CHAIRS: Dr. Pravin Sitaram, *Haartz Corp.*  
Hoa Pham, *Sonoco* | Austin Wagenhals, *Ford Motor Co.*



ONE is designed to be applied to just one substrate for premium laminations rather than both substrates and still provide the excellent bond strength and reliability that is expected from all of our Thermanex® products.

This presentation will focus on the Thermanex® ONE material, the benefits of using it in a single side application, how it compares to our traditional Thermanex® adhesives and the value it brings to the market.



## NEXT-GENERATION TPE SOLUTIONS FOR SUSTAINABLE INNOVATION

**Stephanie O'Kon, Kraiburg**

KRAIBURG TPE introduces a pioneering concept in the thermoplastic elastomers sector, blending recycled and bio-based materials with thin-walled hollow glass microspheres to craft specialized TPE compounds. This innovation results in materials with significantly lower densities (below 0.85 g/cm<sup>3</sup>) and a reduced carbon footprint by up to 30%, compared to traditional TPEs made from virgin raw materials. Targeting automotive, industry, and consumer sectors, this approach not only meets the rising demand for sustainable products but also maintains high performance standards, supporting customers in achieving their environmental objectives. This advancement represents KRAIBURG TPE's commitment to sustainable material solutions without compromising quality.



## INTEGRATION OF PCR CONTENT IN AUTOMOTIVE INTERIOR APPLICATIONS

**Andrea Scantambulo, Sirmax**

Although the use of sustainable compounds in the automotive industry seems promising, the presence of recycled content in the material can induce several limitations to ensure high quality molded components. The introduction of green compounds to produce high-performance components – visible or structural – requires both a full control of the material production chain and the ability to understand and prevent the risks associated with their use in the injection molding process. The aim of this paper is to show Sirmax's multidisciplinary approach to expand the use of recycled plastics even in challenging applications, working on one hand on the material to ensure maximum quality, and on the other hand on the process through numerical simulation to better support designers in the development phase.

The numerical-experimental approach used to eliminate process-induced defects on existing molds for the production of various automotive components made of polypropylene compound with 30 % PCR content is described.



## NEW SUSTAINABLE GENERATION OF ANTIMICROBIAL FOR POLYOLEFIN

**Dr. Mai Ha, Microban**

The growth of microorganisms on surfaces is a major problem affecting the useful life of many products due to diminished physical properties, aesthetics, and/or odor. The inclusion of an EPA registered biocide(s) into the material at the time of manufacturing has been shown to substantially extend the product's life cycle. A pioneer in material protection, Microban is now introducing Ascera, a new, inspired by nature, metal-free, and patent pending antimicrobial product. Ascera represents a new generation of sustainable antimicrobial for polyolefin such as PE, PP, EVA, EPDM and more.



## ADVANTAGES OF INJECTION MOLDING BEHIND THIN FILM TPO

**David Whitehead, Inteva Products, LLC**

Injection molding behind TPO Thin Film is a single step manufacturing process which provides benefits in both performance and haptics to a TPO clad part for interior trim applications. This process enables the use of injection molded materials and technologies which are not suitable for Class-A appearance, without the need for post molding processes such as cladding or painting. In this discussion, we will cover the various approaches and the overall advantages of the technology.

# INNOVATIONS IN INTERIORS

SESSION CO-CHAIRS: Dr. Pravin Sitaram, *Haartz Corp.*  
Hoa Pham, *Sonoco* | Austin Wagenhals, *Ford Motor Co.*



## SUSTAINABLE AND LIGHT-WEIGHT INTERIOR DUCTS: NEW POSSIBILITIES WITH ULTRA-LOW DENSITY PP FOAMS

Joel Pierce, *Borealis Compounds, Inc.*

Ultra-low-density polypropylene (PP) foam sheets significantly support the EU directive for vehicle end-of-life recycling targets. This study presents an air duct made from ultra-low density PP foams, demonstrating enhanced thermal insulation, noise absorption, and a lower carbon footprint compared to solid HDPE ducts. Without the need for cross-linking, production waste is recyclable, ensuring end-of-life recyclability.



## NEW POLYOLEFIN FOAMS FOR AUTOMOTIVE INTERIOR TRIM CONTAINING SUSTAINABLE CONTENT

Paul Sieradski, *Toray*

The PEF Division of Toray Plastics (America) has begun producing foams with sustainable content. The first of these is a positive vacuum forming grade of foam that replaces a legacy product widely used in the industry on door panels and other interior trim articles. Additionally, negative vacuum forming grades are also being introduced to the market for IMG and similar processes containing sustainable content. Performance and physical properties will be presented and discussed.



## MASTERING VARIABLE & RECYCLED FEEDSTOCKS TO DECARBONIZE PLASTIC PRODUCTION

Todd Hughes/James Mazurek, *MATERI'ACT*

To decarbonize the production footprint of automobiles, government regulations and OEM mandates are quickly providing more definition and guidelines on recycled materials. FORVIA's MATERI'ACT presents processes, products, and innovations to meet and exceed these standards. Through its JV MATERI'ACT Dallas, FORVIA's sustainable business model collects feedstock and develops and delivers recycled compounds to meet the growing need for sustainable materials in the North America automotive industry.



## ADDRESSING THE CIRCULARITY CHALLENGE OF THE NEW EU END-OF-LIFE VEHICLES REGULATION: POST-CONSUMER RECYCLED PP FOR HIGH END AUTOMOTIVE INTERIOR APPLICATIONS

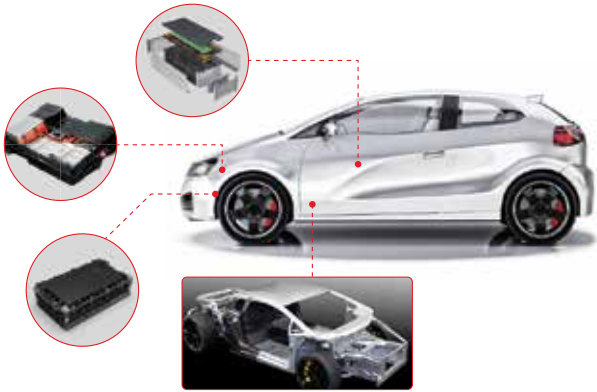
Joel Pierce, *Borealis Compounds, Inc.*

The new EU end-of-life vehicles (ELV) regulation proposes a mandate of 25% recycled plastics in new vehicles for type-approval. Historically, recycled plastics from post-consumer waste, such as municipal waste or end-of-life vehicles, had low and inconsistent quality. This paper systematically evaluates advanced mechanical recycled polypropylene, showing it is highly suitable for ambitious closed-loop recycling targets. Relevant application test results, including mechanics, emission, fogging and odor testing, will be presented.

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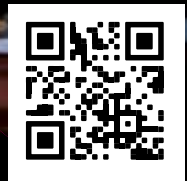
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# EXTERIOR TRIM & STRUCTURAL APPLICATIONS

SESSION CO-CHAIRS: Mark Pilette, *Magna (Retired)*

Charlie Yang, *LyondellBasell* | Kevin DeGrood, *Borealis Compounds, Inc.*



## MIC METALLIC TPO FOR EXTERIOR APPLICATIONS

Kevin DeGrood,  
*Borealis Compounds, Inc.*

As lightweighting continues to be a major goal for all applications in the automotive industry, pushing TPO into areas once thought difficult is now becoming more commonplace. One of these areas thought to be difficult to achieve is TPO molded in color metallic for exterior applications to replace parts that are painted and even made with engineered resins. The challenges include maintaining appearance in production molding, part performance, and dimensional stability.

This presentation will show how Borealis addressed these challenges with different processing techniques and material improvements to meet difficult appearance parameters, specifications, and part performance criteria to create parts that are lightweight and maintain performance expected of these parts.



## ADDRESSING TIGER STRIPE DEFECTS OF TPOS FOR DEMANDING MIC APPLICATIONS

Alberto Prieto, *LyondellBasell*

Tiger striping is a critical appearance property for molded in color parts for both interior and exterior applications. At the same time, versatility of the TPO materials allows OEM opportunity for part consolidation, expansion into new applications, and reduction in wall thickness, all these present significant challenge in developing products without tigerstripe defect

on molded parts. This presentation will give an overview of the tigerstripe phenomena including the causes, mechanisms, and strategies taken at LyondellBasell to address this issue through product innovation and process optimization.

## TWO ADVANCE SIMULATION METHODOLOGY FOR WARPAGE OPTIMIZATION OF LARGE AND WELDED ASSEMBLIES

Erich Vorenkamp, *SABIC*

Warpage is challenging defects occurring in injection molded plastic parts, particularly for large parts & welded assemblies. Traditional approaches for warpage compensation rely on correction factors for the final tool. However, this method is time consuming & non-optimal. This paper presents two simulation methods “Warpage Counter Correction” & “Warpage of Assembly” as an automated, iterative method to improve warpage prediction. These tools are used in product development cycle with multiple customers.



## CHROME-LIKE EFFECT COATINGS FOR EXTERIOR TPO APPLICATIONS

Guy LaRouche, *General Motors*  
Bill Coy, *Mankiewicz Coatings, LLC*

Chrome finishes have long been desirable for automotive exterior parts and now further enhancements of the chrome are available via post-chroming processes where functional and special-effect coating layers are added. While most automotive exterior plastic parts moved to more lightweight and cost-effective substrates like TPO and PP, the chrome parts were required to remain with styrenic materials to be compatible with the multiple layers required for the chrome plating process. In this presentation we will discuss new chrome-like coatings that produce similar effects but can be applied on TPO and PP with few process steps and proven performance characteristics.



## VEHICLE CRASH AND ENERGY MANAGEMENT USING LONG GLASS FIBER POLYPROPYLENE

Anil Tiwari, *SABIC*

Long glass fiber polypropylene (LGF-PP) is an established lightweight material for structural parts in automotive. Due to its unique failure mechanism, LGF-PP is explored for energy absorbers, providing better overall performance compared to incumbent. Using honeycomb-based design, advanced material modeling and experimental study, we present our latest development on crash management using LGF-PP, crumple zone design for new Mobile Progressive Deformation Barrier (MPDB) and sustainable material options.



## TPOS WITH RECYCLED CONTENT FOR FULLY PAINTABLE APPLICATIONS

Tomik Mouradian, *LyondellBasell*

LyondellBasell has successfully commercialized the CirculenRecover TPO products containing mechanically recycled materials. This effort is to combat plastic waste, reduce carbon footprint from the environment, and support the automotive OEMs' sustainability efforts. This presentation will cover the challenges and solutions for developing CirculenRecover TPO materials for paintable bumper and exterior trim applications. The focus is on achieving the stiffness and impact balance as well as paintability comparable to the prime TPO grades. The talk will be concluded with examples of the successfully developed products.

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# SUSTAINABILITY

SESSION CO-CHAIRS: Dr. Petya Yaneva, SABIC  
Mark Allen, Dow Chemical | Dr. Murali Reddy, CCC Plastics



## HISTORICAL USE OF RECYCLED PLASTICS IN AUTOMOTIVE APPLICATIONS- MYTH VS REALITY- TIME TO CHANGE THE PARADIGM!

Susan Kozora, IAC Group

In this presentation the historical use of recycled plastics and recycling in general in the automotive industry will be reviewed. Examples of past and current use of recycled plastics will be explored. An overview of the material approval process at the OEMs for use of recycled plastics, supplier quality requirements and over-all infrastructure of recycling processes within automotive applications will also be covered. We will look at why the current paradigm on use of recycled materials exists today and how it is changing.



## THE MASS BALANCE APPROACH AND ISCC PLUS FOR THERMOPLASTIC OLEFINS: TRANSITION TO A CIRCULAR ECONOMY

Peter Hawighorst, ISCC

Along complex supply chains, chain of custody concepts like mass balancing ensure the credible connection of sustainability information to TPO materials and products in commerce, which is critical to the reputation of the companies involved. ISCC PLUS is used by more than 4,200 system users worldwide, across entire supply chains from the point of origin of the initial bio-based or circular raw material to converters, plastic producers, and brand owners. ISCC PLUS provides TPO producers and end customers with credibility and acceptance for both B2B partners and consumers and can potentially be used for reporting under regulatory frameworks or for credible claims towards customers.



## CLOSING THE LOOP: INNOVATIONS IN DURABLE GOODS END-OF-LIFE MANAGEMENT

Kari Bliss/Hayden Latham, Padnos

In the quest for a sustainable future, addressing the end-of-life phase of durable goods is paramount. This presentation delves into the current practices of shredding durable goods at the end-of-life, highlighting the environmental impact and the critical need for integrating end-of-life considerations into Life Cycle Assessments (LCA). A focal point of the presentation is a success story in the recovery of polypropylene (PP) from Automotive Shredder Residue (ASR). By exploring cutting-edge technologies, we showcase a transformative approach to extract value from discarded goods. This success story not only exemplifies the economic viability of circular practices but also underscores the environmental benefits of diverting materials from landfills.



## EFFICIENT OPTIMIZATION OF NATURAL FIBER NONWOVEN PANELS

Christopher Oberste, Weav3D Inc.

WEAV3D and Antolin have partnered to demonstrate weight savings, performance improvements, and cost effectiveness of using WEAV3D composite lattice structures to reinforce thermocompression molded natural fiber polypropylene nonwoven mats (NFPP mats). Lattices were manufactured using either glass fiber polypropylene tapes or natural fiber polypropylene tapes and then co-molded with NFPP mats to produce a mixture of test panels and full-scale automotive components. This presentation will summarize key performance and forming data from the project and present a case study on the benefits of lattice optimization within an automotive component.

# SUSTAINABILITY

SESSION CO-CHAIRS: Dr. Petya Yaneva, SABIC

Mark Allen, Dow Chemical | Dr. Murali Reddy, CCC Plastics



## TPO MATERIAL PREPARATION FOR CHEMICAL RECYCLING

Robert Wahlmuller, *EREMA*

Chemical (also referred to as Advanced) Recycling is quickly finding its path alongside Mechanical recycling. Geared towards material streams that cannot be easily recycled through the traditional mechanical/pelletizing processes, Chemical processing offers the opportunity to reclaim materials that were previously not recoverable. Material types that are not in abundance as a single source, often are available as mixed with other like polymers. Chemical or Advanced recycling technology offers the possibility to reprocess these material streams, divert them from landfill or incineration and produce raw materials that can then be converted back into high value/purity polymers again. The first step in the process after collection and transport is size reduction, where the material can be brought to a size suitable for further processing, such as washing and sortation. Such technologies for these materials are quite specialized to handle the type and amount of contamination, as well as the abrasive nature of rocks, dirt, and sand. This is where Chemical and Mechanical diverge, and we will discuss the unique challenges for each process.

## A NOVEL PURIFICATION METHOD TO RECYCLE POLYPROPYLENE, APPLICATIONS TO AUTOMOTIVE

Susan Blackson, *PureCycle*  
Katie May, *Milliken*

Dissolution purification is a novel recycling process that purifies polymers, e.g. PP, from contamination. It is neither chemical nor mechanical recycling, but rather physical recycling. That means that the process does not alter the chemical structure of the input resin, but rather purifies it from contaminants. The resultant purified & recycled PP has properties comparable to its counterpart virgin resin. This purified & recycled PP could be compounded to fit different automotive applications. In this presentation we will discuss the impact-properties of the modification of the purified & recycled PP and compare it to those of virgin PP.



## CIRCULEN PRODUCTS – SOLUTIONS FOR ACHIEVING YOUR CIRCULARITY GOALS

Ryan Breese, *LyondellBasell*

LyondellBasell is a leader in the global chemical industry creating solutions for everyday sustainable living. We are one of the world's largest producers of polymers and a leader in polyolefin technologies in various industries and applications such as sustainable transportation, food safety, clean water and quality healthcare. In this presentation, we will discuss the advantages of our three families of Circulen products of mechanically recycled, advanced recycled and renewable-based polypropylene and polyethylene. We will also discuss our roadmap to achieve our goal of producing and marketing 2+MM tons of recycled and renewable-based polymers annually by 2030.



## NOVEL POLYOLEFIN COMPOUNDS USING AIRCARBON, THE BIOMATERIAL MADE FROM METHANE-BASED GREENHOUSE GAS

Mr. Yosuke Furuya, *Sumitomo Chemical Company*  
Mark Herrema, *NewLight Technologies*

Sumitomo Chemical is committed to provide technology solutions to enhance the comfort level and secure the optimal safety to the automotive industry by continuously developing novel materials. We have succeeded in developing novel polyolefin compounds using PP and AirCarbon™, which is a biopolymer made from methane-based greenhouse gas and produced by Newlight Technologies whose third party-certified carbon footprint is significantly negative.



## SUSTAINABLE MATERIAL PILLARS IN THE AUTOMOTIVE INDUSTRY

Rich James, *Dow*

Sustainable material pillars in the automotive industry focus on reducing carbon emissions, using eco-friendly materials, and promoting energy efficiency. Examples include recycled plastics and wastes to bio-based materials. These efforts contribute to a more responsible and environmentally conscious automotive sector.



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# PERFORMANCE ADDITIVES & COLORANTS

SESSION CO-CHAIRS: Heejung Kwon, Songwon

Dr. John Mara, Amfine | Dr. Raziye Mohammadi, Ford Motor Co



## POLYMER ADDITIVE TECHNOLOGIES CONTRIBUTING TO INCREASING THE VALUE OF AUTOMOBILES

**Daniel Turley, Amfine**

Polymer materials are superior to other materials in terms of designability and processability and are now used in many automobile components. Recently, their contribution to sustainability and to GHG emissions reduction has attracted attention with their applications expected to expand further. This paper describes the latest technologies to enhance the value of automotive materials by using polymer additives, focusing on nucleating agents, light stabilizers and non-halogenated flame retardants.



## ORGANOCLAY BASED FIRE RETARDANT SYNERGIST FOR LOW VOLTAGE WIRE AND CABLE APPLICATIONS

**Anthony Carignano, Elementis Global**

This presentation will discuss the application of naturally derived organoclays as effective synergists for halogen-free fire retardants used in olefin-based low voltage wires and cables, particularly suitable for automotive e-mobility applications. The focus of the presentation is on how organoclays enhance the performance of fire retardants by optimizing loading levels, thereby improving both mechanical and flexural properties while effectively mitigating flame spread in compounded low voltage plastics.



## IMPROVING THE UV WEATHERABILITY OF BRIGHTLY COLORED AUTOMOTIVE TPOS

**Matt Tiza, LyondellBasell**

This presentation explores strategies to formulate and to stabilize several colored TPO grades for automotive applications. Various colorants and UV stabilizers were evaluated to optimize the simulated UV weatherability of TPO materials using controlled irradiance Xenon arc methods. This presentation summarizes a method used to evaluate UV stabilizers, pigments, and UV weathering data over time to generate predictive failure models for brightly colored TPO materials.



## LONG-TERM THERMAL STABILIZATION STRATEGIES IN DIFFERENT PP SYSTEMS

**Heejung Kwon, Songwon**

Polypropylene (PP) today is used in a very broad range of applications. Adding fillers (e.g. calcium carbonate or talc) to PP is to improve mechanical properties, dimensional stability, and thermal extension coefficient or simply to reduce costs. Fillers can absorb stabilizers on their surface, or metal residues accelerate the degradation and so reduces the service lifetime of the PP products.

In this paper, long-term thermal stabilization strategies are reviewed in different PP systems.



## EVOLUTION OF FRUNK, MATERIALS, AND SUSTAINABILITY

**Dr. Haibo Zhao, Geon Performance Solutions**

The paper discusses the advancements and trends in frunk design, focusing on the materials used and their impact on sustainability in the automotive industry. The topic begins by discussing the emergence of frunks in electric vehicles (EVs) and the need for lightweight and durable materials that meet safety standards while maximizing storage capacity. Moreover, the challenges and opportunities in integrating sustainable materials within frunk manufacturing are discussed, encompassing cost considerations, weight reduction, circular economy and consumer perceptions.



## HIGH-PERFORMANCE PIANO BLACK FOR AUTOMOTIVE APPLICATIONS

**Dr. Jun Tian, Birla Carbon**

High surface area carbon blacks offer a deep black color, appealing blue tone, and excellent surface finish. Consequently, this class of carbon blacks has gained popularity in high-value plastic applications, including automotive, household appliances, and consumer electronics. The next generation piano black stands out for its unparalleled jetness and blue tone, achieved through engineered morphology, high cleanliness, and excellent dispersibility in plastic systems. This presentation focuses on the morphology, processing, and color performance of this high-performance piano black in polypropylene and polycarbonate resins.

# PERFORMANCE ADDITIVES & COLORANTS

SESSION CO-CHAIRS: Heejung Kwon, *Songwon*

Dr. John Mara, *Amfine* | Dr. Raziye Mohammadi, *Ford Motor Co*



## NOVEL LIGHT STABILIZER FOR POLYPROPYLENE/THERMOPLASTIC OLEFIN INTERIOR APPLICATIONS

**Dr. Lily Liu, BASF Corporation**

As demand for weight reduction in traditional and electric vehicles continues to grow, so does the demand for polypropylene (PP) and thermoplastic olefins (TPO) materials for use in vehicles. These plastics must meet demanding requirements for weathering resistance, thermal aging stability, and low emissions, while offering favorable ecological and toxicological profiles. In this presentation, we share performance data on our novel, cost-efficient light stabilizer for PP/TPO systems, demonstrating excellent weathering and long-term thermal stability, as well as a favorable ecotox profile.



## COLORING TPV'S FOR INTERIOR APPLICATIONS

**Dr. Sassan Tarahomi, Alterra Holdings**

Interior vehicle color match has always been a challenge for material suppliers and Tier-1 molders, especially when the base resin is TPV. Thermosetting rubber in a thermoplastic matrix nature of TPV requires precise compounding and paying attention to the process design and parameters. Adding color to the compound increases the degree of difficulty. Therefore, TPV compounders must be precise in formulation, processing, and color match to insure the final compounded TPV meets the automotive OEM color approval. This presentation proposes a method to speed up the entire TPV color approval process.



## IONIC ADDITIVE TO ENHANCE RECYCLED POLYOLEFIN MATERIALS

**Eric Evelhoch, Resin Solutions**

Recycled polyolefin streams come from a variety of sources and are often inconsistent in their composition and properties. The degradation incurred following the use and recycling of polyolefins reduces their molecular weight and lowers their physical properties, limiting their use in certain applications. Dymalink 9200, an ionic additive, creates a thermo-reversible network that can improve recycled polyolefin properties and broaden the utility of recycled polyolefin streams.

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# AUTOMOTIVE INNOVATION AWARDS COMPETITION & GALA

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## Power of Plastics

### Call for Nominations

#### MOST INNOVATIVE USE OF PLASTICS AWARDS

The Automotive Division of the Society of Plastics Engineers (SPE®) is announcing a “Call for Nominations” for its **53<sup>RD</sup>-Annual Automotive Innovation Awards Gala**, the oldest and largest recognition event in the automotive and plastics industries. This year’s Awards Gala will be held Wednesday, **NOVEMBER 13, 2024** at the Burton Manor in Livonia, Michigan. Winning part nominations in 10 different categories, and the teams that developed them, will be honored with a **Most Innovative Use of Plastics** award. A **Grand Award** will be presented to the winning team from all category award winners.

Nominations are due **SEPTEMBER 13, 2024** and must be made online: <https://speautomotive.com/wp-content/uploads/2024/01/2024-SPE-Innovation-Awards-Program-Part-Nomination-Form-V1.pdf>

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This annual event currently draws over 800 OEM engineers, automotive and plastics industry executives, and media. A variety of sponsorship packages - including tables at the banquet, networking receptions, advertising in the program book, signage at the event and more are available. Contact Teri Chouinard of Intuit Group at [intuitgroup@gmail.com](mailto:intuitgroup@gmail.com).

For more info and to submit nominations, go to: <https://speautomotive.com/spe-automotive-div-innovation-awards/>

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  - BODY EXTERIOR
  - CHASSIS/HARDWARE
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# 2024 SPE TPO STUDENT POSTER COMPETITION

## SUPPORTING SCIENTISTS OF TOMORROW

Students from Ecotek Lab - a Detroit-based research and innovation organization dedicated to supporting the scientists of tomorrow - will present their plastic research projects in a Technical Project Poster Competition at the 2024 SPE TPO Global Automotive Conference. We are expecting 30+ students from Ecotek Lab to join us at our 25th Anniversary Conference, with many students showcasing their material projects in the competition. These young scientists are academically gifted middle and high school students who participate in international science research ventures.



Ecotek Lab, based in TechTown Detroit helps children develop and nurture scientific and critical thinking skills. Founded in Detroit in 2005 by Keith Young, Ecotek Lab reaches over 4,000 Michigan kids annually, preparing them for leadership roles. Today, Ecotek Lab has grown outside of Michigan, to also include Florida and Maryland, and true to its motto - Science at Work - has enabled 15 start-up companies with some former students in leadership positions.



## WEDNESDAY, OCTOBER 2

**9:00 - 11:00AM / 12:00 - 4:00PM**

**POSTERS DISPLAYED IN HALLWAYS**

**11:00AM - 12:00PM**

**COMMITTEE JUDGING - NILES I & II**

**1:15-1:30PM**

**AWARD WINNERS ANNOUNCED - HALLS I-II-III**

## AWARDS

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Keith Young,  
 Founder, CEO  
 Ecotek Lab



Ecotek Lab: Keith Young at [ecoteklab@gmail.com](mailto:ecoteklab@gmail.com)



# CALL FOR PRESENTATIONS

DEADLINE FOR ABSTRACTS – JANUARY 31, 2025  
 DEADLINE FOR PRESENTATIONS – FEBRUARY 28, 2025

## PRESENT TO INDUSTRY DECISION MAKERS IN AUTOMOTIVE PLASTICS

Be part of the all new SPE Automotive Plastics in Electric & Autonomous Vehicles Conference and learn how electric and autonomous vehicle development is driving innovative automotive solutions. This event will feature technical presentations, keynote speakers and panel discussions, networking breakfasts, breaks, lunches and receptions, and exhibits that highlight advances in this fast-growing industry.

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 Dhanendra Nagwanshi, SABIC  
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 Maggie Baumann, FRX Polymers
- > **ELECTRIFIED POWERTRAIN AND POWER DISTRIBUTION**  
 Dr. Jeff Helms, Celanese Corp.  
 Dr. Monoj Ghosh, Eaton Corp.  
 Dr. Javed Mapkar, Daikin America, Inc.
- > **ADVANCED DRIVER ASSISTANCE SYSTEM (ADAS)**  
 Dr. Jacob Dickinson, Celanese Corp.  
 JP Wiese, Nexeo Plastics
- > **MATERIAL INNOVATIONS**  
 Harsh Modi, Tesla  
 Richard Luxgrant, Stellantis  
 Sunit Shah, LyondellBasell
- > **EVOLUTION OF INTERIORS**  
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 Jim Keller, Mankiewicz Coatings LLC  
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 Drew Geda, Hyundai-Kia America  
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