



TPO® 2019

**AUTOMOTIVE ENGINEERED
POLYOLEFINS CONFERENCE**

Troy, MI • October 6-9, 2019

Presented by SPE Detroit Section



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WELCOME

TO THE 2019 SPE TPO CONFERENCE

Thank you for attending the **20th annual SPE® TPO Automotive Engineered Polyolefins Conference**, the world's leading automotive Polyolefins forum. On behalf of our hardworking planning committee and all of SPE, we welcome you to the conference and wish you a very successful event.

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

This is an exciting year for our conference because we turn 20 and it looks like we'll set a lot of records:

- We expect more than 1000 guests from around the world.
- We have our most comprehensive technical program ever. Five great key note speakers, bringing you the hottest topic in the Automotive industry. Six major presentation by Industry leaders summarizing the past 20 years of TPO life in auto industry and setting the goals for the next 20 years of material and process development. Sixty top notch presentations by authors who are leaders in their area of expertise. We also expanded the technical presentation to 3 large halls to allow for 660 attendees to simultaneously attend the six technical tracks in three parallel sessions throughout the event.
- Two special workshops on early evening Sunday.
- We have our reduced our exhibition this year to make sure we have adequate space for our technical sessions. Many thanks to the support of our dedicated sponsors and exhibitors being with us for our 20th anniversary.

We are sure you will leave here better informed than when you arrived — assuming you visit our sponsors and catch our technical program — but you also should leave with lots of new contacts. That's because we've built numerous networking opportunities into our 2018 program.

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

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

See you all at the conference!



Neil Fuenmayor,
LyondellBasell



John Haubert,
FCA US LLC



Bill Windschief,
Advanced Innovation Solutions



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Visit us at the 2019 TPO Conference in Detroit

TECHNICAL

PROGRAM HIGHLIGHTS

In commemoration of the 20th anniversary of the conference we have invited Six Industry Leaders (experts in specific topics) to present their reflections of the major implementations of the TPO materials for the automotive parts in the last 20 years and provide their forecasts on technology trends for the next 20 years. Each of the presentations will address one of the Six pillars of the TPO Evolution and Growth for the automotive applications: Materials Development, Surface Enhancements, Interior Applications, Exterior Applications, Structural Applications, and Process Enabling Technologies.

We have scheduled these presentations right after the Keynotes on all three days in the large conference hall before lunch to accommodate all the conference participants. Further details of these talks are provided in a special article on Super Sessions and in the conference schedule. The presenters did a fabulous job gathering all pertinent details on their topic, capturing and analyzing significance of different developments, summarizing their importance, and finally providing a vision for the future innovations. We are confident that these talks will be of great interest and provide valuable insights on these six topics.

The conference used a Technical Writer to review these presentation files with the presenters and provide a narration of the talks focusing on capturing "Lessons Learned or Takeaways". Two to three page narrations of each of these six talks are included in the Proceedings Book for you to review with your colleagues. We hope we are adding value to you with these narrations and appreciate feedback.

Because of the Super Sessions, the regular sessions are consolidated into 6 from 10 sessions we had last year with three co-chairs for each session. The conference committee gave us three large session rooms with good seating capacity to schedule three concurrent sessions on all three days. The program schedule provides all the details of the sessions.

We urge you to engage the presenters in discussion for elaboration of details and improved clarity of the subject discussed. The presenters will be delighted to address any questions and gratified with 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 feedback on what you liked and how we can improve. Further we seek your support for next year event in volunteering to organize a session (by recruiting presenters) or join the organizing committee (for managing sponsorships and exhibits).



Dr. Norm Kakarala,
SPE Fellow and Honored
Service Member



Dr. Alper Kiziltas,
Ford Motor Company



David Helmer,
General Motors Company



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2019 GENERAL INFORMATION

COMMITTEE CONTACT INFORMATION

CONFERENCE CO-CHAIRS

Neil Fuenmayor, LyondellBasell
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John Haubert, FCA US LLC
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Bill Windscheif,
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SPONSORSHIP / EXHIBIT CO-CHAIRS

Dr. Sassan Tarahomi, Alterra Holdings
starahomi@auto-tpo.com

David Okonski, General Motors Co.
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CONFERENCE REGISTRATION

Karen Rhodes-Parker, SPE
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TECHNICAL PROGRAM CO-CHAIRS

Dr. Norm Kakarala, Retired – Delphi Corp.
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David Helmer, General Motors Co.
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2019 EVENT APP

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Each day we will have a prize drawing
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2019 PLANNING COMMITTEE

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Neil Fuenmayor, LyondellBasell
John Haubert, FCA US LLC
Bill Windschief, Advanced Innovation Solutions

TECHNICAL PROGRAM CO-CHAIRS

Dr. Norm Kakarala, retired-Inteva Products LLC
Dr. Alper Kiziltas, Ford Motor Co.
Dave Helmer, General Motors Co.

SPONSORSHIP CO-CHAIRS

Dr. Sassan Tarahomi, Alterra Holdings
David Okonski, General Motors Co.

FPO OTHER COMMITTEE & STAFF

STAFF SUPPORT

Karen Rhodes-Parker, SPE Detroit Sect.

SECRETARY

Jim Keller, Mankiewicz Coatings, LLC

TREASURER

Tom Powers, Delta Polymers – retired

HOUSE

Bill Windschief, Advanced
Innovative Solutions

TIMELINE / JOB DESCRIPTIONS

Dr. Sassan Tarahomi, Alterra Holdings
Bill Windschief, Advanced
Innovative Solutions, LTD

KEYNOTE SPEAKERS

Bill Windschief, Advanced
Innovative Solutions

SCHOLARSHIPS

Ermanno Ruccolo, PolyOne
Sanjay Patel, PolyOne
Dr. Sassan Tarahomi, Alterra Holdings
Dr. Norm Kakarala, Inteva Products LLC
– retired
Bill Windschief, Advanced
Innovative Solutions, LTD
David Okonski, General Motors Corp.

OEM PARTICIPATION

Neil Fuenmayor, LyondellBasell
John Haubert, FCA US LLC

USB DRIVES / ONLINE ACCESS

Neil Fuenmayor, LyondellBasell
Dr. Sassan Tarahomi, Alterra Holdings

PLAQUES / AWARDS / PARTS COMPETITION

Nippani Rao, Rao Associates
Dr. Suresh Shah, Delphi Corp. – retired
Bill Windschief, Advanced
Innovative Solutions, LTD

COMMITTEE MEMBER RECRUITMENT

Dr. Sassan Tarahomi, Alterra Holdings
David Okonski, General Motors Co.

PROCEEDINGS BOOK

Karen Rhodes-Parker, SPE Detroit Sect.
Dr. Norm Kakarala, Inteva Products LLC
– retired
Jill Houser, JPI Creative
Jim Alexander, Maple Press

CONFERENCE FEEDBACK

Ahmed Osama, The Dow Chemical Co.

DAY OF CONFERENCE STAFF SUPPORT

Rob Philp, Sirmax
Ed Bearse, Advanced Plastic Consultants LLC
Chris Hescheles, Mytex Polymers
Lyle Beadle

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Sue Wojnicki, SPE Headquarters
Jill Bahm, Mercury Communications
Jill Houser, JPI Creative

WEBSITE

Jill Bahm, Mercury Communications
Karen Rhodes-Parker, SPE Detroit Sect.

AUDIO/VIDEO/COMPUTERS

Dr. Laura Shereda, Asahi Kasei Plastics
Rob Philp, Sirmax

APP

Scott Marko, SPE Headquarters

SIGNS/POSTERS

Dr. Sassan Tarahomi, Alterra Holdings
Karen Rhodes-Parker, SPE Detroit Sect.
Jill Houser, JPI Creative
Suzanne Lee, That Color

UNIVERSITY STUDENTS

Dr. Sassan Tarahomi, Alterra Holdings

SESSION CO-CHAIRS

MATERIALS DEVELOPMENT

Mike Balow, Asahi Kasei Plastics
Mark Jablonka, Dow
Peter Glenister, LyondellBasell

ADDITIVE MANUFACTURING (3D PRINTING)

Kurt Anthony, Washington Penn Plastics
Dr. Suresh Shah
Nehir Bhuva, Asahi Kasei Plastics NA

INTERIOR APPLICATIONS & LAMINATING ADHESIVES

Dr. Pravin Sitaram, Haartz Corporation
Sarah Gatzek, Ford Motor Co
Hoa Pham, Freudenberg
Performance Materials

BIO BASED & RECYCLED MATERIALS

Susan Kozora, IAC Group
Dr. Alper Kiziltas, Ford Motor Co.

LIGHTWEIGHTING OF PLASTIC PARTS

Mike Shoemaker, Borealis
Normand Miron, Washington Penn Plastics
Dr. Nadeem Bokhari, Sumitomo Chemical

PROCESS DEVELOPMENTS

Kurt Anthony, Washington Penn Plastics
Dr. Suresh Shah
Dr. Li Lu, Ford Motor Co.

SURFACE ENHANCEMENTS & COATINGS

Dr. Rose Ryntz, Ryntz Associates
Jeff B. Crist, Ford Motor Co.
Jim Keller, Mankiewicz Coatings



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SALUTE TO OUR SPONSORS

The SPE TPO Automotive Engineered Polyolefins Conference would not exist without the gracious support of our sponsors, who underwrote the cost of facilities and equipment rentals, food and beverages, production and printing of our program guide, and many other items, large and small. Hence, it is with great appreciation that we thank and acknowledge the contributions of our 2019 sponsors, exhibitors, and other patrons in making this event a success.

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SUNDAY OCTOBER 6

EXHIBITION SET-UP STARTS

TUTORIAL 1: **HP 3D Printing TPO Parts**

Speaker Name, Speaker Company

TUTORIAL 2: **Impossible Objects, 3D Printing Fiber Reinforced Parts** Speaker Name, Speaker Company

EVENING RECEPTION: Sponsored by **Formosa Plastics Group**

MONDAY OCTOBER 7

REGISTRATION & CONTINENTAL BREAKFAST: Sponsored by **Mytex Polymers**

WELCOME REMARKS: Conference Co-Chair, **Neil Fuenmayor**, Lyondellbasell

KEYNOTE 1: **Global PP Update: What a Difference a Year Makes!** **Joel Morales**, Director Polyolefins North America, HIS Markit

KEYNOTE 2: **Occupy Your Position on the 'Design Maturation Spectrum'** **Jeevak Badve**, Principal, Director Strategic Growth, SundbergFerar

LUNCH SPONSOR & RECEPTION SPONSOR REMARKS: **Sumitomo Chemical Company & Advanced Composites**

TECHNICAL PROGRAM HIGHLIGHTS: **Norm Kakarala**, General Motors Co., **Dr. Alper Kiziltas**, Ford Motor Co.

BREAK: Sponsored by **Sirmax North America**

CONFERENCE HALL-I

MATERIALS DEVELOPMENT

Mike Balow, Asahi Kasei Plastics
Mark Jablonka, Dow
Peter Glenister, LyondellBasell

Advanced Reactive Based Compounded Materials for Interior, Exterior and Under Hood Applications
Dr. Sassan Tarahomi, Alterra Holdings

Injection Molded High Gloss Black TPO for Automotive Exterior Applications
Quentin Boll, LyondellBasell

Low Emission and Sustainable TPE for Interior Soft-Touch Innovations
Dr. Thomas Köppl, Hexpol TPE

CONFERENCE HALL-II

ADDITIVE MANUFACTURING (3D PRINTING)

Kurt Anthony, Washington Penn Plastic Co., Inc. / **Dr. Suresh Shah**
Nihir Bhuvra, Asahi Kasei Plastics North America

Simulation Driven Design for Additive Manufacturing: Opportunities for the Entire Supply Chain
Ravi Kunju, Altair

Digital Texturing Techniques for Automotive 3D Printing
Alex Ju, HP Inc.

3D Printed Prototype Parts out of Production Material in Single or Multi Component Technology
Trevor Pruden, Arburg

CONFERENCE HALL-III

INTERIOR APPLICATIONS & LAMINATING ADHESIVES

Dr. Pravin Sitaram, Haartz Corporation
Sarah Gatzek, Ford Motor Co.
Hoa Pham, Freudenberg Performance Materials

Autonomous Vehicles, Car sharing and Electric Vehicles Are Driving Smart Applications and TPOs/TPEs will benefit
Bob Eller, Robert Eller Associates LLC

TPO Advances for Interior Applications
Jason Fincher, Advanced Composites

Advanced TPO and TPE materials for the interior of Autonomous and Electric Vehicles
Dr. Sassan Tarahomi, Alterra Holdings

LUNCH: Sponsored by **Sumitomo Chemical Company**

MATERIALS DEVELOPMENT

Meeting Tomorrow's TPO Performance Requirements with Next Generation Polyolefin Elastomers
Mark Jablonka, Dow

Innovative SEBS for Improving the Properties of TPEs and Engineering Plastics for Automotive Parts
Sherry Takagi, Asahi Kasei Corporation

SK Global Chemical High Performance Polypropylenes and Polyolefin Elastomers for Sustainable Solutions for the Automotive Industry
Dr. Fanny Deplace, SK Global Chemical

New Styrenic Block-Copolymer Impact Modifiers for TPO Compounds
Dr. Amit Desai, Kraton

ADDITIVE MANUFACTURING (3D PRINTING)

Polyolefins in Powder Ben Fusion Additive Manufacturing
Dr. Michelle K. Sing, Braskem

Utilizing Conformal Cooling in Injection Molding
John Tenbusch, Linear AMS

Numerical Simulation of Warpage for Thermoplastic Parts in Fused Filament Fabrication (FFF) Process
Dr. Danielle Zeng, Ford Motor Co.

Composite Based Additive Manufacturing (CBAM) 3D Technology
Jeff DeGrange, Chief Commercial Officer, Impossible Objects Inc.

INTERIOR APPLICATIONS & LAMINATING ADHESIVES

Advancements of the Kraton™ IMSS Technology for Automotive Interiors
Dr. Amit Desai, Kraton

TPO Acoustics Absorbers for Hybrid and Electric Vehicles
Dr. Ali Khosroshahi, Michael Demo
Freudenberg Performance Materials LP

Thermoplastic Elastomers (TPE) for Automotive Interior Applications
Juan Espinosa, **Steve Cranney**, Kraiburg TPE

Introduction of Functionalized Air Bag Cover Thermoplastic Elastomers (TPEs)
Hitoshi Kageyama, Sumitomo Chemical Co., Ltd

BREAK: Sponsored by **TBD**

12:00 PM

3:00 PM

4:00 PM

5:00 PM

7:00 AM

8:30 AM

8:45 AM

9:15 AM

9:45 AM

10:00 AM

10:30 AM

11:00 AM

11:30 AM

12:00 PM

1:30 PM

2:00 PM

2:30 PM

3:00 PM

3:30 PM

MONDAY OCTOBER 7 CONTINUED

	CONFERENCE HALL-I	CONFERENCE HALL-II	CONFERENCE HALL-III
	MATERIALS DEVELOPMENT Mike Balow, Asahi Kasei Plastics Mark Jablonka, Dow Peter Glenister, LyondellBasell	BIO BASED & RECYCLED MATERIALS Susan Kozora, IAC Group Dr. Alper Kiziltas, Ford Motor Co.	LIGHTWEIGHTING OF PLASTIC PARTS Mike Shoemaker, Borealis Normand Miron, Washington Penn Plastic Co., Inc. / Dr. Nadeem Bokhari, Sumitomo Chemical Co., Ltd
4:00 PM	Extending the Value of Polypropylene Composites filled with Glass Fiber/Talc via Superior Additive Technologies Kenji Yamashita, ADEKA Corp.	Effect of Micro- and Nanoscale Fillers on the Mechanical and Thermal Properties of PP-Based Nanocomposites Dr. Alper Kiziltas, Ford Motor Co. Dr. Debbie Mielewski, Ford Motor Co.	Fiber Reinforced Polyolefin Materials for Lightweight Constructions Harald Herbst, Borealis
4:30 PM	High Stiffness and High Impact Glass Filled Polypropylene with Improved Heat and Chemical Stability Dr. Lily Liu, PolyOne	Biocarbon- A Renewable and Lightweight Functional Filler for Polymer Composites Dr. Atul Bali, CGT Ayse Ademagavun, Varroc Dr. Alper Kiziltas, Ford Motor Co.	High Performance Light-Weighting Polyolefins Replacing Engineered Plastics Hideaki Nishio, Nicolas Schlutig, Sumika Polymers NA
5:00 PM	Environmentally Friendly Applications of Talc in Automotive Polyolefins Piergiorgio Ercoli Malacari, IMI Fabi	Why a New Generation of Bio Based Olefinic Materials are rRequired for Tomorrow's Vehicle Interior Dr. Sassan Tarahomi, Alterra Holdings	Carbon Fiber Demand Forecast and Recycling Challenges Markus Kralicek, Borealis
5:30 PM	RECEPTION: Sponsored by Advanced Composites, Inc.		

TUESDAY OCTOBER 8

7:30 AM	REGISTRATION & CONTINENTAL BREAKFAST: Sponsored by ExxonMobil		
8:30 AM	WELCOME REMARKS: Conference Co-Chair, John Haubert , FCA Group		
8:45 AM	KEYNOTE 1: Front & Center: A Focus on the Automotive Rules of Origin in U.S. Trade Negotiations Kristin Diczek, Vice President – Industry, Labor, & Economics at Center for Automotive Research		
9:15 AM	KEYNOTE 2: Global Automotive Elastomers Innovation and Outlook Dr. Arash Kiani, CEO, Alterra Holdings		
9:45 AM	CONFERENCE SPONSOR RECOGNITIONS: LUNCH SPONSOR & RECEPTION SPONSOR REMARKS: HP & Braskem AWARDS PRESENTATIONS: SPONSOR RECOGNITIONS & AWARDS FOR THE 2019 TPO PARTS COMPETITION WINNERS		
10:00 AM	BREAK: Sponsored by Borealis		
	CONFERENCE HALL-I MATERIALS DEVELOPMENT Mike Balow, Asahi Kasei Plastics Mark Jablonka, Dow Peter Glenister, LyondellBasell	CONFERENCE HALL-II BIO BASED & RECYCLED MATERIALS Susan Kozora, IAC Group Dr. Alper Kiziltas, Ford Motor Co.	CONFERENCE HALL-III LIGHTWEIGHTING OF PLASTIC PARTS Mike Shoemaker, Borealis Normand Miron, Washington Penn Plastic Co., Inc. / Dr. Nadeem Bokhari, Sumitomo Chemical Co., Ltd
10:30 AM	Advanced UV and Thermal Stabilizer Solution for Enhancing Durability of Automotive TPO Dr. Kyle O'Connor, Solvay	Improving the Properties and Durability of Recycled Automotive Plastics Bringing New Life by Restabilization Nancy Cliff, BASF	Innovative Solutions for Maintaining Aesthetics while Creating Light Weight Polyolefin and TPO Applications Luca Gazzola, SIRMAL
11:00 AM	Latest Stabilization Solutions for Automotive TPOCompounds Emilie Meddah, Clariant	Breakthrough Developments in Functional Fillers Dr. Chris DeArmitt, Arctic Minerals	Lightweighting Solutions in Filled Polypropylene Systems Dr. Lily Liu, PolyOne
11:30 AM	A Developed Antioxidant Formula that Improves Color and Melt Index Compared with Conventional Blends David Chui, FDC Lees Co.	Circular Economy New Challenges and Opportunities for the Plastic Industry: A Polyolefin Producer Approach Daniel Bahls Pierera, Borealis	Advances in Lightweight PP Materials Enabled by 3M Glass Bubbles Erik Labelle, 3M
12:00 PM	LUNCH: Sponsored by HP Inc.		

TUESDAY OCTOBER 8 CONTINUED

	CONFERENCE HALL-I	CONFERENCE HALL-II	CONFERENCE HALL-III
	MATERIALS DEVELOPMENT Mike Balow, Asahi Kasei Plastics Mark Jablonka, Dow Peter Glenister, LyondellBasell	PROCESS DEVELOPMENTS Kurt Anthony, Washington Penn Plastic Co., Inc. Dr. Suresh Shah Dr. Li Lu, Ford Motor Co.	SURFACE ENHANCEMENTS & COATINGS Dr. Rose Ryntz, Ryntz Associates Jeff B. Crist, Ford Motor Co. Jim Keller, Mankiewicz Coatings, LLC
1:30 PM	Permanent Ion Conductive Anti-Statics in TPOs Jukka Jillberg, Croda	Weight Reduction of Plastic Components by Using Modern Technology Trevor Pruden, Arburg	Paint, Color and Coatings for Autonomous Vehicles Chris Seubert, Ford Motor Co.
2:00 PM	Highly Efficient and Innovative Halogen Free Flame-Retardant Solution for Polyolefin Materials Dr. Gary Rex, Hangzhou JLS Flame Retardants	Flexible Injection Molding Solutions for the Integration of Functional Films Jason Holbrook, Krauss-Maffei Corp.	Coating Innovations on the Horizon Karen Kukla, Akzo Nobel
2:30 PM	Sustainable Stabilization Solutions that Address Latest Automotive Trends Thomas SantaMaria, Solvay	Reducing Inspection Based on Data Driven Results from Design of Experiments (DOE) Suhas Kulkarni, FimmTech Inc.	Visual Assessment of Color – The Importance of Visual Color Harmony from Concept to Production Perry Banta, LyondellBasell
3:00 PM	New Novel Odor Detection Method Dr. Laura Shereda, Asahi Kasei Plastics North America	Flow-Line Defect Analysis for a Thermoplastic Polyolefin David Okonski, General Motors	Understanding the Design life of Materials. How is it Measured, Why you Should Care, and What is Possible Chris White, NIST
3:30 PM	BREAK: Sponsored by CIMBAR Performance Minerals		
	MATERIALS DEVELOPMENT Mike Balow, Asahi Kasei Plastics Mark Jablonka, Dow Peter Glenister, LyondellBasell	PROCESS DEVELOPMENTS Kurt Anthony, Washington Penn Plastic Co., Inc. Dr. Suresh Shah Dr. Li Lu, Ford Motor Co.	SURFACE ENHANCEMENTS & COATINGS Dr. Rose Ryntz, Ryntz Associates Jeff B. Crist, Ford Motor Co. Jim Keller, Mankiewicz Coatings, LLC
4:00 PM	Benefit of Long Chain Branched PP (LCB) for Foam Molding Dr. Keni Masuda, JPP Mr. CK Yoon, Mytex	Knit-Line Defect Analysis for a Thermoplastic Polyolefin David Okonski, General Motors	Adhesion Promotion Using Flame Plasma Surface Treatment - A Tutorial Joseph DiGiacomo, Flynn Burner Corporation
4:30 PM	Engineering Heterophasic Copolymer Polypropylene (Impact Copolymer PP): Super Flow and Super Toughness ICP for Automotive Ccompounding K.K. Vimal, Indian Oil Corp	Enhanced Screw Element Designs for Improved Throughput and Quality of Highly Filled Polyolefins Paul Anderson, Coperion Corporation	Quantitative Determination of Adhesive Strength in Polymeric Laminates and Coatings Dr. Sue, Texas A&M University
5:00 PM	An Additive Approach to Tailored Melt Strength in PP and TPO Brett Robb, Total Cray Valley	Composite Hybrid Reinforcements in Tailgates: A Feasible Solution for Mass Production? Dinesh Munjurulimana, SABIC	Over-Molding Decoration (OMD) Tom Barr, Wavelock
5:30 PM	RECEPTION: Sponsored by Braskem		

WEDNESDAY OCTOBER 9

REGISTRATION & CONTINENTAL BREAKFAST: Sponsored by **Red Spot**

7:30 AM

8:30 AM

8:45 AM

INTRODUCTION OF KEYNOTE SPEAKER: Conference Co-Chair, **Bill Windscheif**, Advanced Innovative Solutions, Ltd.

KEYNOTE: *Plastics Sustainability and State of Recycling*

Kim Holmes, Vice President, Sustainability at Plastics Industry Association (*Conference Halls I & II Combined*)

9:15 AM

BREAK: Sponsored by **TBD**

CONFERENCE HALL-I

INTERIOR APPLICATIONS & LAMINATING ADHESIVES

Dr. Pravin Sitaram, Haartz Corporation
Sarah Gatzek, Ford Motor Co.
Hoa Pham, Freudenberg Performance Materials

CONFERENCE HALL-II

PROCESS DEVELOPMENTS

Kurt Anthony, Washington Penn Plastic Co., Inc.
Dr. Suresh Shah
Dr. Li Lu, Ford Motor Co.

CONFERENCE HALL-III

SURFACE ENHANCEMENTS & COATINGS

Dr. Rose Ryntz, Ryntz Associates
Jeff B. Crist, Ford Motor Co.
Jim Keller, Mankiewicz Coatings, LLC

9:30 AM

High Performance Reactive Hot Melt Adhesives for PVC - TPO foam skins

Dr. Martin Weller,
H. B. Fuller Adhesives Deutschland

Optimized Extrusion Process for Developing High Performance & Lightweight TPOs

Dr. Tanmay J Pathak,
LyondellBasell

Characterization of Stress in Protective Automotive Coatings

Jennifer David,
Momentive

10:00 AM

TPO Frame for Acoustic Parts

Meagan Marko,
Noble Polymers, LLC

Ultrasonic Welding of Thermoplastic Olefins (TPO's)

Dr. Jane Lu, LyondellBasell

Effect of Long-chain Branching on Scratch Behavior of Polypropylene

Dr. Sue, Texas A&M University

10:30 AM

SRD-5219: Pre-Applied Waterbased Adhesive for Automotive Interior Applications

Jessica Gunder,
Sunstar Engineering Americas

Numerical Case Study Assessing Key Factors of Foaming Ability in Injection Molded Parts

Alex Baker,
Moldex3D N.A.

Experimental Observation and Numerical Modeling on Mar Behavior of Amorphous Polymers

Shuoran Du, Texas A&M University

11:00 AM

New Soft Feel Polypropylene Compound with Excellent Scratch Performance for Automotive Interior Applications

Dr. Zahra Fahimi, SABIC

Plastic Processing Solutions using Integrated Infrared Thermal Machine Vision

Chris Lemmons,
Emitted Energy

Tuning the Haptic Profile of Soft-touch Waterborne Coatings with Organic Matting Agents and Feel Additives

Dr. Xiangyi Zhang, Dow

11:30 AM

Metal Rear Injection for Decorative Automotive Interior Surfaces

Jeff Bailey,
Nolax AG

Improved PP LGF for Aesthetic Parts

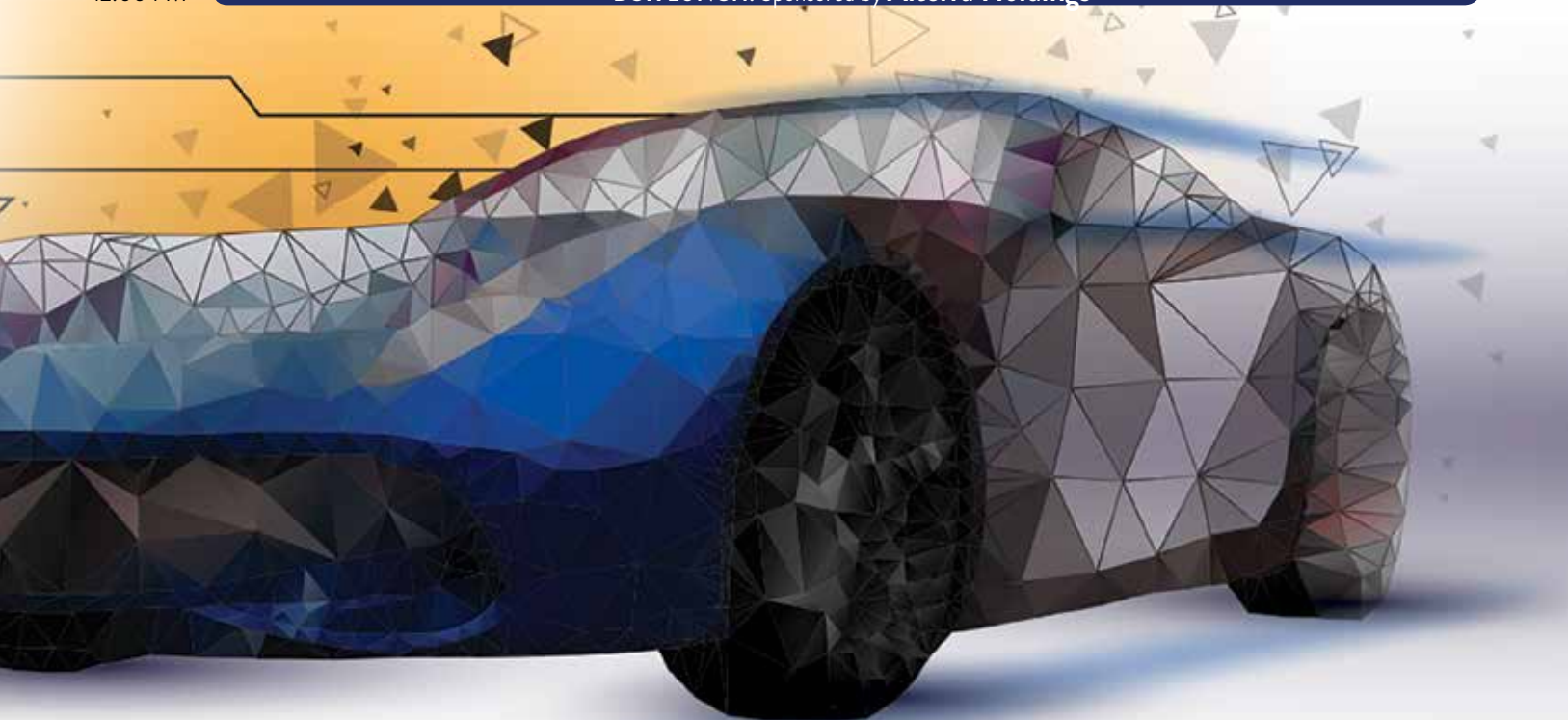
Tony Samurkas,
Trinseo

Advances in Commercial Technology for Scratch & Mar Resistance in TPO Compounds

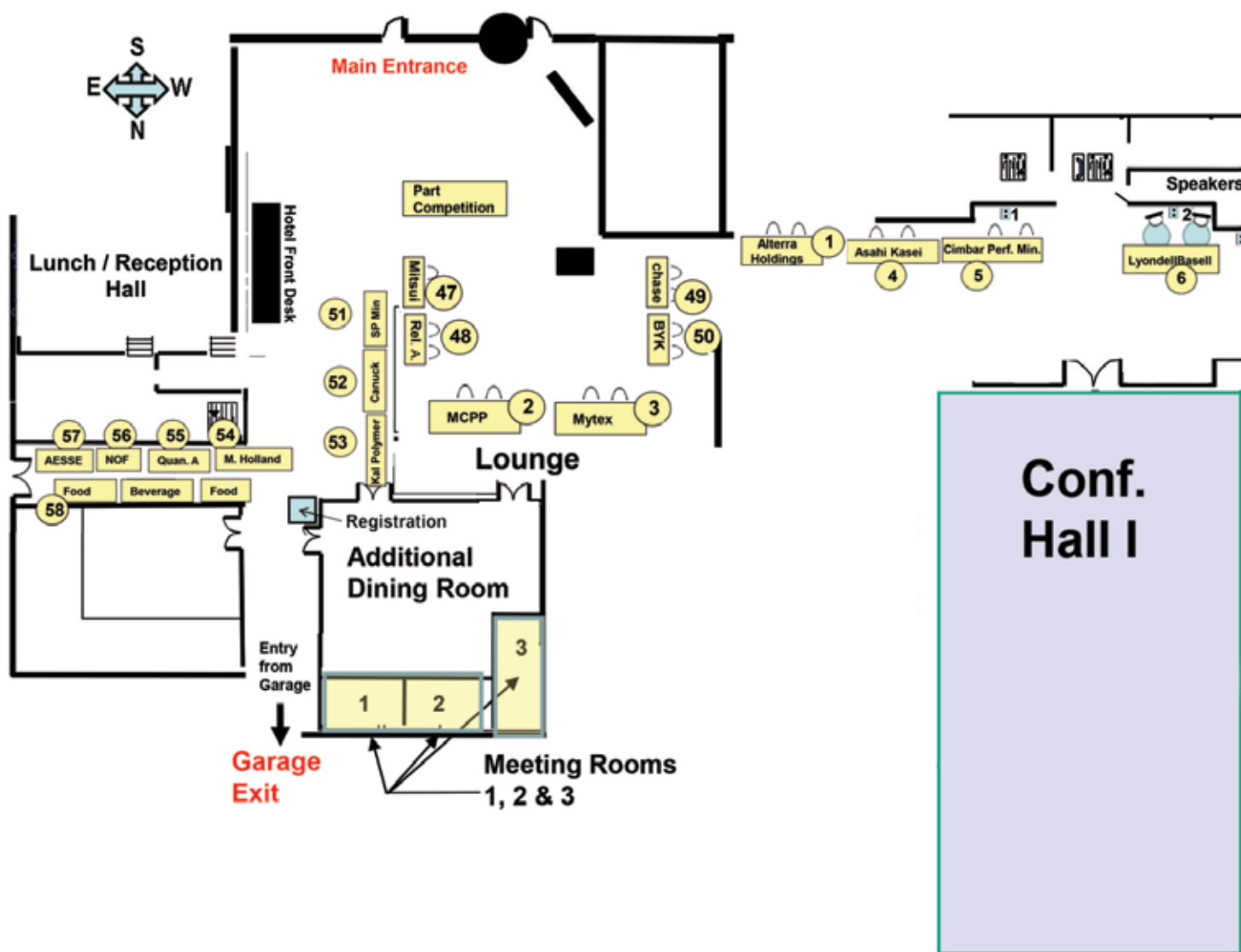
Mike McCormack,
AESSE Sales & Distribution

12:00 PM

BOX LUNCH: Sponsored by **Alterra Holdings**



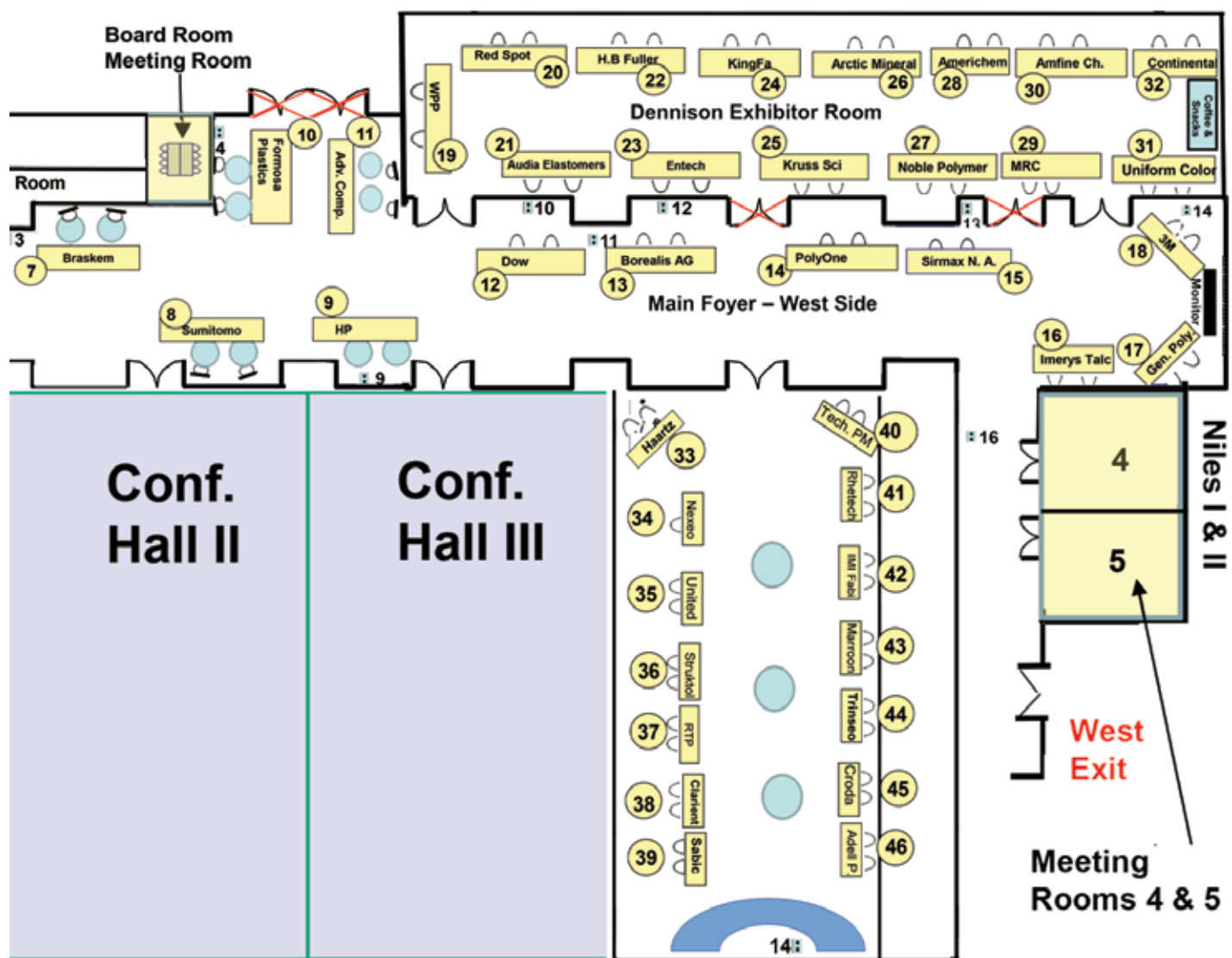
2019 EXHIBITOR



EXHIBITORS ALPHABETICALLY

COMPANY	BOOTH NUMBER	COMPANY	BOOTH NUMBER
3M	18	Chase Plastics	49
Adell Plastics	46	Cimbar Performance Minerals	5
Advanced Composites	11	Clariant	38
Aesse	57	Continental	32
Alterra Holdings	1	Croda	45
Americhem	28	Dow	12
Amfine	30	Entech	23
Arctic Mineral	26	Formosa Plastics	10
Asahi Kasei Plastics	4	General Polymers	17
Audia Elastomers	21	H.B. Fuller	22
Borealis	13	Haartz	33
Braskem	7	HP Inc.	9
BYK	50	Imerys Talc	16
Canuck Compounds	52	IMI Fabi	42
		Kal Polymers	53

LOCATIONS 2019



EXHIBITORS ALPHABETICALLY

Kingfa	24	Red Spot	20
Kruss Scientific Instruments	25	Reliable Analysis	48
LyondellBasell	6	Rheteck	41
M Holland	54	RTP Company	37
Maroon Group	43	SABIC	39
MCCP	2	Sirmax N.A.	15
Mitsui Plastics	47	Specialty Minerals	51
MRC Polymers	29	Struhtol	36
Mytex	3	Sumitomo	8
Nexeo Plastics	34	TechmerPM	40
Noble Polymers	27	Trinseo	44
NOF America	56	Uniform Color	31
PolyOne	14	United Paint	35
Quantum Analytics	55	Washington Penn Plastics, Co.	19

2019 KEYNOTE SPEAKERS

The 21st Annual SPE® TPO Automotive Engineered Polyolefins Conference, the world's leading automotive engineered polyolefins forum, will showcase talks by keynote speakers from IHS Markit, Sundberg-Ferar, Center for Automotive Research, Alterra Holdings and the Plastics Industry Association. The theme of this year's 2019 technical conference and exhibition is *"TPO's Driving Innovation Forward."*



Joel Morales

Executive Director Polyolefins Americas
IHS Markit

GLOBAL PP UPDATE: WHAT A DIFFERENCE A YEAR MAKES!

The conference keynotes take place each morning and will kick off Monday, October 7 with an opening keynote by Joel Morales, Executive Director Polyolefins Americas, IHS Markit. The title of his talk is, "Global PP Update: What a difference a year makes!" Adding capacity while removing demand has transitioned a tight market to one that is more balanced. Joel will elaborate on what has changed and what the near-term future looks like given these evolving dynamics. "The world of polypropylene has seen some significant changes since our presentation at last year's conference," Joel notes. His remarks will focus on how new investment in global polypropylene capacity has come onto the scene at the same time global demand has slowed down.

Jeevak Badve

Principal and Director of Strategic Growth
Sundberg-Ferar

OCCUPY YOUR POSITION ON THE 'DESIGN MATURATION SPECTRUM'

The conference's second keynote on Monday will feature Jeevak Badve, Principal and Director of Strategic Growth for Sundberg-Ferar. Jeevak will share his thought-provoking talk, "Occupy Your Position on the 'Design Maturation Spectrum'." Learn about this spectrum, where your business falls and how to leverage the fundamentals of industrial design for the entire product design cycle. According to Jeevak, "truly enlightened businesses in the TPO and polymer industries position industrial design thinking at the very core of their strategic initiatives. These businesses apply it as an integral management tool in the boardroom to guide their aspirational business growth in the automotive market and beyond." Understanding how to blend in the emotional attributes that are imperative for your product to be truly successful, you can employ industrial design to create materials and plastics products that are sought-after - not only to generate larger profit margins, but ultimately for the betterment of the human condition.



2019 KEYNOTE SPEAKERS

Kristin Dziczek

Vice President of Industry, Labor & Economics
Center for Automotive Research (CAR)

FRONT & CENTER: A FOCUS ON THE AUTOMOTIVE RULES OF ORIGIN IN THE US TRADE NEGOTIATIONS



Kristin Dziczek, Vice President of Industry, Labor & Economics at the Center for Automotive Research (CAR), will launch day two of the TPO conference on Tuesday, October 8. Kristin's keynote, "Front & Center: A Focus on the Automotive Rules of Origin in the US Trade Negotiations," will provide an overview of the USMCA trade deal and its potential impact on North American supply chains, as well as an examination of the status of ongoing US trade negotiations related to auto and parts trade. Kristin notes that global trade changes continue to be in flux. "Whether it be the United States Mexico Canada Agreement (USMCA), trade talks with China, Japan, the European Union, and the United Kingdom, or the national security trade investigations, policies aimed at improving the position of the U.S. automotive industry have been a primary focus of the current Administration."



Dr. Arash Kiani

CEO, Alterra Holdings

GLOBAL AUTOMOTIVE ELASTOMERS INNOVATION AND OUTLOOK

On Tuesday, October 8, a second keynote features Dr. Arash Kiani, CEO, Alterra Holdings. His keynote, "Global Automotive Elastomers Innovation and Outlook" will focus on the rapid changes in the global automotive industry and how innovation in elastomer technology provides an outlook of future products. Arash notes, "Automotive OEM are going through major transformation of their vehicle design and capabilities and they need materials that exceed the current material properties with lower density and be very cost effective. Elastomers are one the family of plastics that are expected to play a larger role in the vehicles of future."

Kim Holmes

Vice President of Sustainability
Plastics Industry Association

DELIVERING ON THE SUSTAINABILITY OF PLASTICS



Kim Holmes, Vice President of Sustainability at the Plastics Industry Association will wrap up the conference on Wednesday, October 9, with her keynote, "Delivering on the Sustainability of Plastics." Kim will share insights on the current market conditions of the recycling industry, provide an update on industry responses to address marine debris, and discuss opportunities for every company in the plastics industry to engage in sustainability efforts. During her talk, Kim says she "will challenge attendees to think critically about how they can competitively position their companies in what will be a new environment for how we conduct business as an industry."



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SUNDAY TUTORIALS FPO

Two tutorials on 3D Printing are presented at the Troy Marriott Hotel
on Sunday October 7th from 3 to 5 PM.

Conference registration is not required. The tutorials are COMPLIMENTARY and offered as service to the industry. Please participate and gain better understanding of these topics.

3:00 PM: 3D Printing of TPO Parts

presenter, HP Inc.

This tutorial

4:00 PM: 3D Printing of Fiber Reinforced TPO Parts

presenter, Impossible Objects

This tutorial will cover

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MATERIALS DEVELOPMENT

SESSION CO-CHAIRS:

Mike Balow, Asahi Kasei Plastics • Mark Jablonka, Dow • Peter Glenister, LyondellBasell

Advanced Reactive Based Compounded Materials for Interior, Exterior and Underhood Applications



Dr. Sassan Tarahomi,
Chief Technology Officer,
Alterra Holdings

Demanding automotive applications require development of advanced reactive based compounded materials. This was result of listening to the customer voice which can be a great guiding light for your material development team. Future autonomous or electric vehicles require tougher, lighter and lower cost material for their exterior, underhood or interior.

Injection Molded High Gloss Black TPO for Automotive Exterior Applications



Quentin Boll,
Product Development Engineer,
LyondellBasell

High Gloss Black, also known as "Piano Black", is an actively sought-after finish for exterior trim applications on modern automotive vehicles. Currently, this finish is achieved by use of an engineered resin or an injection molded substrate that is painted or wrapped. The development of this High Gloss Black TPO offers significant cost savings via ease in manufacturability, improved processing flexibility, part durability, as well as substantial decrease in part weight compared to the incumbent.

Low Emission and Sustainable TPE for Interior Soft-Touch Innovations



Dr. Thomas Köppl,
Group Product Manager,
HEXPOL TPE

Requirements for automotive TPEs continue to increase, especially in the areas of interior air quality, haptics, abrasion resistance, cleanability and sustainability. This paper will cover the contribution made by TPE's to

odour, fogging and VOC's in the passenger compartment and introduce newly developed TPE compounds from HEXPOL TPE which reduce emissions on average by 75%, enabling one to easily meet the emissions requirements of OEMs today as well as address future increasing requirements.

Meeting Tomorrow's TPO Performance Requirements with Next Generation Polyolefin Elastomers



Mark Jablonka,
Product Technology Leader, Dow

Polyolefin elastomers are a key component of automotive TPOs, enabling a variety of final part application performance targets to be met. Over the years Dow has developed numerous grades of polyolefin elastomers enabling expansion of the application space for TPOs. This work will highlight Dow's latest developments in the polyolefin elastomer area and how TPO performance differentiation can be achieved with next generation polyolefin elastomers.

Innovative SEBS for Improving the Properties of TPEs and Engineering Plastics for Automotive Parts



Sherry Takagi,
Sales Manager,
Asahi Kasei Corporation

Asahi Kasei is a world leading supplier of innovative hydrogenated styrenic thermoplastic elastomers (SEBS: "TUFTECTM" and "S.O.E.TM"). In this session, we will introduce unique SEBS grades suitable for obtaining soft touch surface, abrasion resistance, and vibration damping properties which are required for automotive interior parts. Also, modified grades which are suitable for enhancing the functionality of engineering plastics (i.e. PA, TPU, PPS)

MATERIALS DEVELOPMENT

SK Global Chemical High Performance Polypropylenes and Polyolefin Elastomers for Sustainable Solutions for the Automotive Industry



Dr. Fanny Deplace,
Senior Leader, SK Global Chemical

SKGC offers a range of polymers and solutions for the automotive and packaging industries. In the area of TPO, SKGC continues to develop advanced and innovative polypropylenes and elastomers. The high crystallinity and impact strength of SKGC polypropylenes combined with high performance polyolefin elastomers allow compounders to optimize their TPO recipes to create environmentally friendly and safe products. A wide range of properties can be achieved from the myriad polypropylene/elastomer combinations that SKGC offers.

New Styrenic Block-Copolymer Impact Modifiers for TPO Compounds



Dr. Amit Desai, Scientist, Kraton

We report development of styrenic block copolymers to increase the compatibility of the block copolymers with polyolefinic elastomer and polypropylene in order to improve the impact resistance of TPO compounds. These new polymers led to an increase in impact strength compared to existing formulation without significantly affecting other physical properties. These new impact modifiers can enable the use of TPO compounds in new applications demanding higher performance, such as thin-walled and low-density parts.

Extending the Value of Polypropylene Composites filled with Glass Fiber/Talc via Superior Additive Technologies



Kenji Yamashita,
Product Manager,
ADEKA Corporation

Engineering plastics and metals have been extensively replaced by polypropylene based materials in automotive parts to achieve both weight reduction and cost

savings. GF-PP and Talc-filled PP are already being used in this application, but further property improvements of the composites are still necessary. This paper mainly describes the effects of advanced nucleating agents in GF-PP/Talc-filled PP such as improvement in mechanical properties, heat distortion characteristics and anisotropy.

High Stiffness and High Impact Glass Filled Polypropylene with Improved Heat and Chemical Stability



Dr. Lily Liu,
R&D Engineer,
PolyOne Corporation

In response to the high demand on lightweighting in the automotive industry, various reinforced polypropylene solutions have been explored and developed. Properties of filled polypropylene which have been greatly improved include stiffness, impact strength, higher fluidity and heat and chemical resistance. In this paper, we will discuss the development of PolyOne's short-glass-fiber reinforced polypropylene which provides enhanced stiffness and impact properties, along with excellent heat and chemical stability.

Environmentally Friendly Applications of Talc in Automotive Polyolefins



Piergiorgio Ercoli Malacari,
Product & Application
Development Manager,
IMIFabi Spa

In this paper, different solutions in using talc for lightweighting will be presented, including polyolefin foaming where talc plays an active role as bubble growth nucleator. Some polyolefin recycling strategies will be presented too, showing how to optimize the final recycled formulation to achieve best final properties, suitable for automotive. A responsible usage of natural resources is promoted as well.

MATERIALS DEVELOPMENT

Advanced UV and Thermal Stabilizer Solution for Enhancing Durability of Automotive TPO



Dr. Kyle O'Connor,
Research Scientist,
Solvay Polymer Additives

The need for automotive TPOs to have combined UV and thermal protection without compatibility, odor, or VOC issues contributed by the additive package is critical.

There have been many efforts across

the industry to develop additive technologies for TPO to endure harsh UV and thermal environments. Today, this paper discusses a new stabilizer solution capable of providing both UV and thermal protection, extending the performance and opening additional high value opportunities for automotive TPO.

Latest Stabilization Solutions for Automotive TPO Compounds



Emilie Meddah,
Technical Marketing Manager,
Clariant

In the past few years started a race for performances in polymer compounds for automotive applications. Lighter, stronger, more durable, easy to clean, better aesthetics, comfort, more sustainable, less smell, healthier, are some of the requirements

expressed by the OEMs. This stringency is making new plastic compounds developments more and more demanding and challenging. Clariant Performance Additives, specialized in polymer stabilization, is introducing new solutions which fulfil current performances requested by the OEMs and beyond.

A Developed Antioxidant Formula that Improves Color and Melt Index Compared with Conventional Blends



David Chui,
Market Manager,
FDC Lees Co.

Olefin-base polymers are very commonly used but are susceptible to discoloration and loss of mechanical properties due to

oxidative degradation during the manufacturing process. Conventional antioxidants may have limitations such as yellowing and reduced processing stability in polyolefins. With the aid of an anti-acid agent, a new formula has shown an improvement in performance over conventional blends in terms of yellowness index, b* and melt flow index.

Permanent Ion Conductive Anti-statics in TPOs

Dr. Emile Homs,
Research and Technology Manager,
Croda

Driven by the increasing number of electronics, electronic components and sensors in modern vehicles, the demand for surface resistivity to repel dust on instrument panels and consoles has been a challenge

for the automotive industry. We will discuss how inherently static dissipative polymers (IDP) differ from traditional antistat and conductive particle/fiber technology, allowing for a permanent solution for dust repellency on sensitive TPO components. These permanent antistats will enable charge mobility and control of static without controlled dissipation of charge imbalance to ensure optimal ESD safety and maintain static dissipative properties throughout the life cycle of plastic automotive interiors.

Highly Efficient and Innovative Halogen Free Flame-Retardant Solution for Polyolefin Materials



Dr. Gary Rex,
Technical Sales Consultant,
Hangzhou JLS Chemical Fire Retardant Co.

Polyolefins have a low Limiting Oxygen Index (LOI) and therefore flame-retardant (FR) modification is necessary. This paper explains the intumescent FR (IFR) mechanism and

introduces both an improved IFR powder and masterbatch concentrate based on the same IFR. FR data obtained show a low peak heat release, low smoke density coupled with low toxicity in both reinforced and non-reinforced polyolefins.

MATERIALS DEVELOPMENT

Sustainable Stabilization Solutions that Address Latest Automotive Trends



Thomas SantaMaria,
Technical Service Chemist,
Solvay Polymer Additives

New trends in the automotive industry require solutions with innovative aesthetics and functionalities. Consumers are demanding vehicles with bright, dazzling metallic effects and ride sharing is becoming

increasingly popular requiring improvements in cleanness and odor. In this presentation, Solvay will share recent advances in its high-performance sustainable UV stabilizers that allow metallic pigment to replace the metallic painting process reducing VOCs and enabling healthier car sharing by enhancing the stabilization of antimicrobial surfaces.

New Novel Odor Detection Method

Dr. Laura Shereda,
Polymer Scientist,
Asahi Kasei

Using the NeOse, developed by an Asahi Kasei sister company, we have been able to detect odor in polypropylene compounds. This method allows us to compare a "chemical fingerprint" of different

samples to one another and also to understand relative intensity from sample to sample. These results will be presented in this paper.

Benefit of Long Chain Branched PP (LCB) for Foam Molding



Dr. Kenji Masuda,
Group Leader,
Japan Polypropylene Company
CK Yoon,
Material Development Manager,
Mytex US Corp

Automotive weight reduction is demanded for better fuel efficiency which is regulated for environmental

concern and foam molding can be one of the solutions to make plastic parts lighter. JPP's New Long Chain branched

polypropylene (LCB-PP) provide significant improvements in foam molding. LCB-PP can be incorporated into standard PP as modifier to improve foaming expansion ratio, cell morphology and mechanical properties.

Engineering Heterophasic copolymer Polypropylene (Impact Copolymer PP): Super flow and Super toughness ICP for automotive compounding



K.K. Vimal,
Research Manager,
Indian Oil Corporation Limited

Indian Oil, with its patent pending process, is able to produce ICP with very high MFI of 100 g/10 min having no-break impact strength and a balanced flexural modulus of 750-1200 MPa. This is achieved

by a simple route of tailoring the molecular architecture of polymer after polymerization in an extruder. In this process no additional filler or elastomer is added. These resins also have shown very good low temperature impact performance equivalent to reactor made TPO.

An Additive Approach to Tailored Melt Strength in PP and TPO



Brett Robb,
Applications Chemist,
TOTAL Cray Valley

Polypropylene is a semi-crystalline polymer with low melt strength. HMS-PP is often used to overcome this deficiency. Adding Dymalink 9200 into PP creates a unique dynamic network leading to

unusually high melt strength behavior even at very low loadings. This allows for a tailored approach to high melt strength in PP-based homopolymers, copolymers, and elastomers that are used in injection molding, thermoforming, and foaming applications. Additionally the boost in melt strength allows for increased incorporation of regrind into these processes.

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NexGen®

X-Linked Butyl

TerraLite®

Foamable Expandable Compounds

TerraSilk®

Additives

ADDITIVE MANUFACTURING (3D PRINTING)

SESSION CO-CHAIRS:

Kurt Anthony, Washington Penn Plastic Co., Inc. • Dr. Suresh Shah • Nihir Bhuva, Asahi Kasei Plastics North America

Simulation Driven Design for Additive Manufacturing: Opportunities for the Entire Supply Chain



Ravi Kunju, SVP, Business Development & Strategy, Altair

Additive Manufacturing (AM) brings promise of design freedom, accelerated product development, customization and part consolidation; opening doors for the entire supply chain with opportunities to improve efficiencies and product performance. A Simulation driven, generative design methods like topology and topography optimization can automatically create lightweight and efficient structures, that are manufacturable (constraints) to meet complex set of performance requirements. The presentation will help lay out an effective and repeatable product design strategy using compelling examples.

Digital Texturing Techniques for Automotive 3D Printing



Alex Ju, CMF Designer, Automotive Applications, HP Inc.

Futuristic vehicles warrant futuristic aesthetics. Additive manufacturing enables exactly that through the streamlined production of parts with innovative, integrated textures. We have been developing digital workflows for the creation and application of such novel textures to 3D-printed plastic parts for automotive applications. We also evaluate the intersection of texture design with material selection and final finishing techniques, addressing the impact of gloss level on the visual and tactile impact of final textured parts.



3D Printed Prototype Parts out of Production Material in Single or Multi Component Technology

Trevor Pruden, Technical/Engineering Manager, ARBURG, Inc.

Rapid Prototyped parts through freeforming capabilities with

exactly the material that the part will be produced in mass production. How it works with Single, and Multi Component Technology. Application examples as Prototype parts as well as small production part. Further the new development by using 3 different materials allowing for 3 K parts or 2 K parts plus one as support material.

Polyolefins in Powder Bed Fusion Additive Manufacturing



Michelle Sing, Ph.D., Technology Development Engineer, Braskem

While it has been around for decades, recent technological advances have increased the prominence of Additive Manufacturing (AM) as an alternative processing technique for polymeric materials. While there has been a surge of innovation surrounding the ability to make AM technologies industrially relevant, the materials portfolios corresponding to the different AM processes have largely remained limited. Braskem has been working to design printable polyolefins and help expand the materials space in AM.

Utilizing Conformal Cooling in Injection Molding



John Tenbusch, CEO, Linear AMS

Conformal Cooling is the optimization of cooling or heating channels that follow the shape of the molded part for productivity and quality improvements. Utilizing DMLM to additively manufacture the insert, the freedom of design allows for lines to be placed an optimal distance from the surface. Conformal Cooling offers a solution to increased cycle times by reaching areas of the part that have hot or cold spots to help control part temperature during molding-minimizing cooling time, scrap, and warpage.

Numerical Simulation of Warpage for Thermoplastic Parts in Fused Filament Fabrication (FFF) Process



Dr. Danielle Zeng,
Technical Specialist,
Ford Motor Company

Additive manufacturing is a growing technology due to its ability to fabricate parts with complex geometries. One of the most common issues in AM process is the warp of the parts. In this work, a new integrated method is developed to model the FFF process and predict the plastic part warpage under different process conditions. The prediction results are compared to the measurement data to demonstrate the accuracy and efficiency of the simulation model.

Composite Based Additive Manufacturing (CBAM) 3D Technology



Jeff DeGrange,
Chief Commercial Officer,
Impossible Objects Inc.

The presentation will provide a detailed look into Impossible Objects Composite Based Additive Manufacturing (CBAM) technology that uses nonwoven composite sheets and thermoplastics to produce 3D Polymer Matrix Composite (PMC) parts. This will include an in-depth material and process discussion into the material combinations, fiber volume, void content and resulting material properties.

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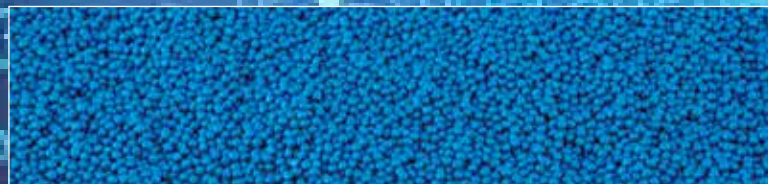
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- | | |
|---------------------------------------|---|
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| ➤ DASHBOARD SKIN (PP/TPO) | : REMOVAL OF CROSS-LINKED FOAM AND COATINGS |
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INTERIOR APPLICATIONS & LAMINATING ADHESIVES

SESSION CO-CHAIRS:

Dr. Pravin Sitaram, Haartz Corporation • Sarah Gatzek, Ford Motor Co.
Hoa Pham, Freudenberg Performance Materials

Autonomous Vehicles, Car Sharing and Electric Vehicles Are Driving Smart Applications and TPOs/TPEs will benefit



Bob Eller,
Robert Eller Associates LLC

Automotive interior functions are at an inflection point with respect to design/performance requirements and fabrication process technologies. TPOs, TPEs and PP compounds as well as the supply chain are evolving to meet the new requirements. A new generation of smart materials is evolving to broaden the capabilities of interior components. This paper will examine implications of this evolution for components such as IP/door trim skins, acoustic components, lightweighting targets and foams.

TPO Advances for Interior Applications



Jason Fincher,
Material Development Manager,
Advanced Composites

Three continuing needs for interior TPO materials are processability, weight reduction, and suitability for safety applications. Advanced Composites has developed materials that meet these needs by providing increased flowability for improved processability while maintaining cold temperature ductility for safety. These materials also provide opportunities for reduced weight. This presentation will characterize the overall performance of these novel materials relative to incumbent TPO.

Advanced TPO and TPE Materials for the Interior of Autonomous and Electric Vehicles



Dr. Sassan Tarahomi,
Chief Technology Officer,
Alterra Holdings

Vehicle development is changing dramatically due to changes in vehicle design, power system and driver needs. Automotive OEM will be designing lighter vehicles with

roomier interior, feeling and looking as an extension of our home, office and a place to relax in complete silence. The radical change of vehicle usage from a simple transportation to a complex human habitat with multidimensional application on wheel would require Advanced interior material.

Advancements of the Kraton™ IMSS Technology for Automotive Interiors



Dr. Amit Desai,
Scientist, Kraton

Kraton™ Injection Molding Soft Skin (IMSS) technology enables the injection molding of large, thin-walled soft skin parts, which allows significant cost-saving over existing technologies, supports light weighting initiatives in automotive and provides a low odor/VOC alternative. Here, we will discuss further progress of the technology, specifically related to improving aesthetics and weatherability. These enhancements will assist in enabling the technology to obtain OEM specification approvals above and beyond those achieved to date.

TPO Acoustics Absorbers for Hybrid and Electric Vehicles



Ali Khosroshahi,
Michael Demo,
Freudenberg Performance
Materials LP

A quiet ride has always been the goal in advanced automotive designs. Since automotive noise covers a wide range of frequencies, designers have used various materials to reduce the noise level in the vehicle. With the increased demand for reducing the vehicle weight, nonwoven fabrics have made inroads into different automotive applications, including acoustics. A nonwoven TPO material was developed to address noise reduction in hybrid and electric vehicles.



INTERIOR APPLICATIONS & LAMINATING ADHESIVES

Thermoplastic Elastomers (TPE) for Automotive Interior Applications



**Juan Espinosa,
Steve Cranney,
Kraiburg TPE**

TPEs are used to produce a variety of automotive interior components such as mats, gaskets, cup holders, etc. Some are stand-alone molded articles, others are overmolded onto various substrates. With increasing consciousness on health and safety, emissions and odor of the interior components have become of great concern. Kraiburg-TPE studied both the effect of each separate raw material and the influence of the manufacturing process on the overall emissions and odor of multiple TPE formulations.



Introduction of Functionalized Air Bag Cover Thermoplastic Elastomers (TPEs)



**Hitoshi Kageyama,
Sumitomo Chemicals Co., Ltd**

For airbag cover applications, appropriate MFR, stiffness and impact strength at low temperature are mandatory properties. Our TPEs, ESPOLEX series, fulfill the properties as well as the other unique characteristics to fit customer's

needs. As an example, excellent aesthetic surface appearance and its concept are going to be introduced.

High Performance Reactive Hot Melt Adhesives for PVC - TPOFoam Skins



**Dr. Martin Weller,
H. B. Fuller Adhesives Deutschland**

Increasing standards for interior trim part durability create the need for RHM (reactive hot melt) adhesives with high heat and hydrolysis resistance and enhanced plasticizer resistance. PVC and TPO

foil-backed foams with PVC foam, while commonly used, remain challenging substrates due to their shape memory and plasticizer content. Quality laminations require adhesives that meet these new requirements. New RHM technology and products enable manufacturers to meet this challenge while maintaining or improving safety and productivity.

TPO Frame for Acoustic Parts



**Meagan Marko,
Noble Polymers, LLC**

Lighter noise treatments that do not sacrifice acoustic performance are desired by automakers for fuel efficiency. This can be accomplished with very light layered fiber silencers. Die-cutting the fiber layers can provide light density, but not part

shape. A TPO flexible frame provides necessary shape with an easily adjustable balance of stiffness and flexibility to allow assembly into the front of dash body. This construction provides a weight savings, cost savings, and better acoustic performance.

SRD-5219: Pre-Applied Waterbased Adhesive for Automotive Interior Applications



**Jessica Gunder,
Sunstar Engineering Americas**

Sunstar has developed a waterborne adhesive that can pre-applied to polyolefin foam blends and untreated polypropylene substrates. It provides quick drying times, excellent strength, low activation temperatures and extended shelf life of pre-applied

materials. The adhesive can be coated at the laminate supplier, therefore eliminating the need to apply and dry the adhesive on site. The interior part producer will only need to heat the foam through normal vacuum forming process.

INTERIOR APPLICATIONS & LAMINATING ADHESIVES

New Soft Feel Polypropylene Compound with Excellent Scratch Performance for Automotive Interior Applications



Dr. Zahra Fahimi,
SABIC

Consumers today demand luxurious haptics and finishes for their interiors – even in lower-priced vehicles. How can automakers satisfy this demand, while managing costs? This session will highlight the chemistry behind one solution – a polypropylene compound, which can deliver a soft, comfortable feel and excellent scratch performance for unpainted, low-gloss automotive interior components. This same solution, which requires only one high-volume injection molding step, eliminates the need for costly secondary operations.

Metal Rear Injection for Decorative Automotive Interior Surfaces



Jeff Bailey,
Nolax AG

Today's automotive design initiatives are focused on making the car more stylish, luxurious, and durable for the consumer. One approach to meet these desires is through the use of "authentic" materials, such as real metal surfaces. This presentation will review film adhesive options that enable the metal rear injection molding process, which combines metal decorative surfaces with plastic injection attachment features.



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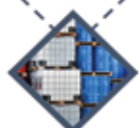
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PROCESS DEVELOPMENTS

SESSION CO-CHAIRS:

Kurt Anthony, Washington Penn Plastic Co., Inc. • Dr. Suresh Shah • Dr. Li Lu, Ford Motor Co.

Weight Reduction of Plastic Components by Using Modern Technology



Trevor Pruden,
Technical/Engineering Manager,
ARBURG, Inc.

With focus on increased cost of energy there is excellent opportunities to increase energy efficiency through weight reduction of IM components ('Light weighting' of parts while maintaining or improving, their performance in their application fields). Using Fiber Direct Compounding as a new Technology will allow for the Fiber added during injection molding instead of during compounding. The result is usually a mechanically stronger part with lower Glass content needed that reduce the overall part weight.

Flexible Injection Molding Solutions for the Integration of Functional Films



Jason Holbrook,
Sales Manager,
Krauss Maffei Corporation

With a single mobile compact production system, a 10-inch HMI with integrated electronics, decorative frame and scratchproof coating can be created with IML film printed conductors on the nozzle side inserted into the mold. Single-image IMD film then runs through the ejector-side mold, transferring its painted design layer and UV-top coat to the plastic surface while another film runs through the mold providing a second-cavity décor for surface aesthetics, which allows backlit revealed operating symbols.



Reducing Inspection Based on Data Driven Results from Design of Experiments (DOE)

Suhas Kulkarni,
President, FIMMTECH Inc.

Design of Experiments is a tool that been used for several decades. However, molders shy away from

using the tool because of the misconception that it takes a lot of time and effort to perform the experiments and analyze the data. The talk will focus on the application of DOEs to Injection Molding and how the analyzed data will help reduce inspection during regular production.

Flow-Line Defect Analysis for a Thermoplastic Polyolefin



David Okonski,
Staff Research Engineer,
General Motors

The author first encountered flow-line defect while launching the fascia tools for the Chevrolet Corvette in May of 2013. Flow-line defect resulted in a very noticeable blemish on the painted surface of a TPO part and was believed to be the result of localized variations in the stress state of contiguous materials. The work presented here will cover the recent progress that has been made in further defining and understanding the root-cause of flow-line defect.

Knit-Line Defect Analysis for a Thermoplastic Polyolefin



David Okonski,
Staff Research Engineer,
General Motors

Knit-lines (both weld and meld) are created when a plastic flows around an obstruction used to create some geometric feature necessary for the implementation of the part. In the work presented here a four factor, sixteen run DOE was used to study the effects of melt temperature, mold temperature, pack pressure, and fill time on the appearance and strength of a knit-line formed by flowing a TPO melt around core pins of different diameter.

PROCESS DEVELOPMENTS

Enhanced Screw Element Designs for Improved Throughput and Quality of Highly Filled Polyolefins



Paul G. Andersen,
Process Technology Consultant,
Coperion Corporation

Co-rotating twin-screw extruders have evolved significantly since being developed. However, kneading blocks have remained essentially the same. To benefit from increased torque capacity of the latest generation compounders, solids conveying and melt/mixing capacity needed improvement. Coperion has developed kneading elements with novel involute cross-section geometry to achieve this objective. This presentation provides comparisons of standard vs. involute kneading elements, specifically looking at some significant aspects related to increased productivity and quality of highly filled polyolefins.

Composite Hybrid Reinforcements in Tailgates: A Feasible Solution for Mass Production?



Dinesh Munjurulimana,
Senior Scientist, Global Technology
Automotive Petrochemicals,
Sabic

Weight reduction is a key driver to meet increasingly stringent emissions legislation, improve fuel efficiency and increase the range of electric vehicles. This paper presents novel design for a composite reinforced lightweight LGFPP inner tailgate structure that could be a viable, and mass-producible concept. Optimal performance at the lowest weight and cost is achieved by selective application of glass reinforced UD-laminate inserts and numerically optimization. Functional integration is applied to ensure acceptable total system cost.



Optimized Extrusion Process for Developing High Performance & Lightweight TPO's

Dr. Tanmay J Pathak,
Product Application Development,
LyondellBasell

The work presented here focusses on the development of a low

density, mineral filled polypropylene composite that exhibits a great balance of properties with high stiffness as well as impact, highly desirable in automotive applications. This was achieved by a balanced formulation approach, but more so with an improved process design on twin screw extruder. The improved extrusion process also helped to convert batch process TPOs to continuous TSE process while enhancing the product properties.

Ultrasonic Welding of Thermoplastic Olefins (TPO's)



Dr. Jane Lu,
Product Application Development,
LyondellBasell

Ultrasonic welding is one of the most commonly used technique for welding the thermoplastic olefins (TPOs) parts in the automotive industry. LyondellBasell has conducted a comprehensive study on evaluating the factors contributing to the weld quality. This presentation will be focused on how the welding parameters and material properties affect the welding strength and read through on the painted TPO surface for bumper applications.

Numerical Case Study Assessing Key Factors of Foaming Ability in Injection Molded Parts



Alex Baker,
Applications Engineer,
Moldex3D N.A., Inc.

Lightweighting is a growing need in a world where speed and efficiency are key. Foaming in plastics materials displaces the plastic with gas bubbles to reduce part weight and makes the part more dimensionally stable; a win-win scenario for quality assurance. Evaluating the distribution of foaming throughout the part gives us an idea of material property consistency and distribution of pressure due to the foaming phenomenon.

PROCESS DEVELOPMENTS

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Chris Lemmons,
Executive Sales Manager,
Emitted Energy Corporation

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Improved PP LGF for Aesthetic Parts



Tony Samurkas,
Director, Technical Service &
Development North America,
Trinseo Performance Plastics

New liftgate designs require PP LGF materials with extremely consistent fiber dispersion and color due to the part having an interior show surface. Our recently developed

ENLITE™ PP LGF grades have excellent fiber wet-out and dispersion, resulting in Class A aesthetics. We will review these new materials with examples of the improvements achieved and of applications where they have been successfully implemented.

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Booth 18

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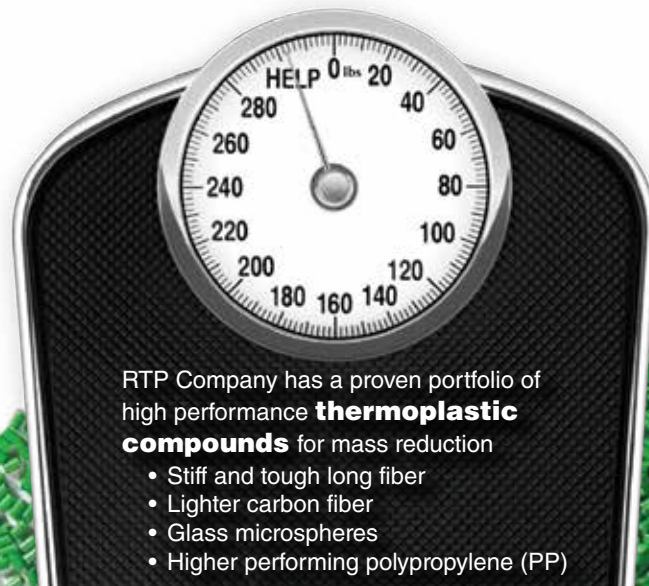
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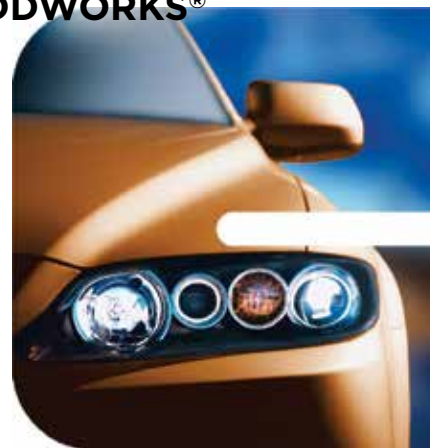
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LIGHTWEIGHTING OF PLASTIC PARTS

SESSION CO-CHAIRS:

Mike Shoemaker, Borealis • Normand Miron, Washington Penn Plastic Co., Inc.

Dr. Nadeem Bokhari, Sumika Polymers NA

Fibre Reinforced Polyolefin Materials for Lightweight Constructions



Herald Herbst,
Business Development Manager,
Borealis

Fibre reinforced materials, prominent in Automotive lightweight constructions, require formulations adapted to the characteristics of the polypropylene matrix, the type of fibre and the fibre amount.

Application engineering requires advanced methods integrating material recipes, conversion processes and details of the application testing. This paper discusses the theoretical background of fibre reinforced polyolefin materials (PPGF, PPLGF and PPCF), special lab methodologies required, and illustrative examples where Integrative Modelling techniques are successfully applied.

Carbon Fibre Demand Forecast and Recycling Challenges



Markus Kralicek,
Business Development Manager,
IC Automotive,
Borealis

Driven by the need for lightweighting, carbon fiber growth brings with it significant challenges, in particular in the areas of resource intensive production and disposal.

Borealis took on these challenges and developed Fibremod™ Carbon – a new generation of Carbon Fiber reinforced Polypropylene materials, creating additional weight savings and down gauging opportunities for Automotive parts. Several case studies, illustrating the variety of possibilities offered with this new generation of materials will be discussed in the presentation.

High Performance Light-Weighting Polyolefins Replacing Engineered Plastics



Mr. Hideaki Nishio,
Automotive Marketing Director,
Sumika Polymers NA
Mr. Nicolas Schlutig,
Technical Manager,
Sumika Polymer
Compounds, France

High performance glass filled low density polypropylene materials technology has been developed that successfully replaces engineered resins and metals in the automotive applications. Unique polypropylene, coupling agents and processing techniques are fundamental to this high-performance propylene compound. Superior mechanical properties are highlighted that had

never been achieved previously. Automotive applications are discussed where not only light-weighting has been achieved but successful cost reductions as well.



Innovative Solutions for Maintaining Aesthetics while Creating Light Weight Polyolefin and TPO Applications



Luca Gazzola,
R&D Polyolefins Manager,
Sirmax S.p.A

Creating visually aesthetic Class A surfaces through the use of a new generation of lightweight materials requires a multi-pronged approach. Various combinations of performance polymers along with special fillers

including talc and glass products are considered based upon the end use. Unique Customer design considerations drive the R&D process to the formulation and localization of available raw materials with controlled interactions.

LIGHTWEIGHTING CONT

Lightweighting Solutions in filled Polypropylene Systems



Lily Liu, PhD,
Lead R&D Engineer,
Polyone

Nowadays, people are focusing more on circular economy to keep the resources in use as long as possible, to extract the maximum value, and to reduce waste. One of the most preferred approaches from manufacturing is to use less initial material. Such approach, called lightweighting, is especially popular in the automotive industry. In this paper, we will introduce PolyOne's lightweighting solutions in various filled polypropylene systems.

Advances in Lightweight PP Materials Enabled by 3M Glass Bubbles



Eric Labelle,
Business Development Manager,
3M Company

Adding high strength hollow glass microspheres to thermoplastics brings lightweighting, productivity, and dimensional stability benefits. 3M's iM16K grade microspheres, with its unique ultra-high strength-to-density can enable lightweight PP compounds that confidently survive typical polymer processing. 3M iM16K glass bubbles can enable PP compounds that achieve an attractive mix of weight savings (~15%), retained properties, and a worthwhile business case in execution. This presentation will highlight usage of iM16K microspheres in PP compounds and potential applications.

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SURFACE ENHANCEMENTS & COATINGS

SESSION CO-CHAIRS:

Dr. Rose Ryntz, Ryntz & Associates • Jeff Crist, Ford Motor Co. • Jim Keller, Mankiewicz Coatings LLC

Paint, Color and Coatings for Autonomous Vehicles



Chris Seubert,
Research Engineer,
Ford

The push to develop autonomous vehicles and remote sensing systems, such as light detection and ranging (LIDAR), has created a need for colors and exterior parts to reflect IR radiation to ensure detection

by the LIDAR sensors. These sensors have also generated a need for lens coatings that are highly transparent to the relevant radiation ranges, but also resist dirt, water, and other fouling during service. In this presentation we will identify how microstructural properties of paint systems affect the ability of LIDAR sensors to detect exterior parts and examine how hydrophobic coatings can be used to prevent fouling of polymeric and glass lenses that are used on LIDAR and camera sensors.

Coating Innovations on the Horizon



Karen Kukla,
Key Account Manager –
Automotive Interiors,
AkzoNobel

This presentation will discuss the reduction of the carbon footprint by use of waterborne coatings and UV coatings. In addition, the importance of UV coatings to improve scratch

and mar resistance, improve energy efficiencies and increase throughput will be discussed. Options for dual cure allowing for upgrade of conventional lines and coating formulations to meet customer needs will be covered.

In addition, the use of bright colors using Nano pigments and dyes, self-healing paint, easy to clean coatings for high gloss interiors, anti-glare coatings and UV reflective coatings to control interior temperature will be introduced.

Visual Assessment of Color - The Importance of Visual Color Harmony from Concept to Production



Perry Banta,
North American Regional Color
Lead,
LyondellBasell

The automotive industry has been utilizing molded in color thermoplastic polyolefins (TPOs) for decades. In a data specific industry, the visual assessment of color in

pre-colored materials remains critical for color approval.

Often color can be viewed as unacceptable while still being in tolerance numerically. At Lyondellbasell, the importance of color harmony between visual appearance and numerical evaluation is key. The critical nature of numerical and visual color harmony and how to successfully achieve and sustain both will be reviewed.

Understanding the Design Life of Materials. How is it Measured, Why you Should Care, and What is Possible



Chris White,
Research Chemist,
NIST

The NIST service life predictions, based on ASTM 1850, have included uncertainty calculations in polymer systems including poly(ethylene), poly(ester), poly(ethylene terephthalate), and epoxy. In each

of these systems, a predictive model grounded in laboratory exposure data is validated with outdoor exposure data. Two complications in the widespread adoption of these methods is that requirement that the formulations are designed to degrade prematurely commercially viable systems to produce these predictions in a reasonable amount of time and the limited availability of the exposure equipment. Both considerations can be addressed with the development of commercially viable exposure equipment. The efforts to incorporate this new equipment into the ASTM 1850 protocols will be detailed.

SURFACE ENHANCEMENTS & COATINGS

Adhesion Promotion Using Flame Plasma Surface Treatment - A Tutorial

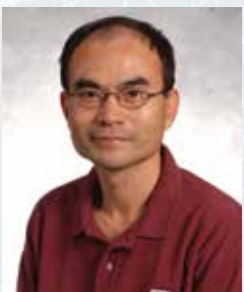


Joseph DiGiacomo,
Vice President,
Flynn Burner Corporation

This paper describes the theory behind gas fired flame plasma surface treatment to promote adhesion of water based inks, coatings, adhesives, labels and other substrate laminates to polyolefin based substrates.

Critical parameters in flame treatment are, flame chemistry, flame geometry, plasma output and distance of the burner to the part. The interrelationship between these variables, and how to control them for optimum surface treatment, will be discussed. The use of Schlieren imaging technology, high speed photographs of the flame geometry, used to develop new burner designs, as well as advances in equipment technology will be presented.

Quantitative Determination of Adhesive Strength in Polymeric Laminates and Coatings



Dr. Sue,
Professor,
Texas A&M University

A testing methodology to evaluate the adhesive strength of epoxy coatings and multi-layered polymeric laminates was developed by implementing a linearly increasing normal load scratch test. Finite

element methods (FEM) modeling was also carried out to quantitatively investigate the corresponding stress state that causes delamination to occur during scratching. By including the exact material constitutive behavior, surface characteristics, and geometry of each laminate layer in the numerical framework, the delamination strength of the laminates can be quantitatively determined using numerical modeling. The determination of the delamination strength between any layers is possible by normalizing geometric factors and material properties in the FEM model. This procedure can be employed to improve laminate performance through changes in formulation and processing conditions.

Over-Molding Decoration (OMD)



Tom Barr,
Senior Vice President,
Wavelock Advanced
Technology Inc.

Decorating TPO can be a challenging and time-consuming process that typically requires multiple steps. New technology makes it possible to reduce the numbers of manufacturing steps, optimize efficiencies and expand your decorative options. The purpose of this presentation is provide an overview of the over-molding decoration process and show how it can produce unique finishes for both interior and exterior automotive TPO parts.

Characterization of Stress in Protective Automotive Coatings



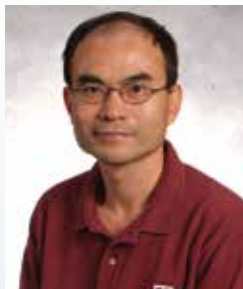
Jennifer David,
Senior Scientist,
Momenive

Cracking and adhesion loss are two critical failure modes for coatings which protect exterior automotive plastics. Coating failure by cracking may occur when the instantaneous stress exceeds the stress threshold.

Here, stress is determined in 5-10 μm protective coatings. A comparison is made of the relative importance of humidity and temperature to coating stress. The methods described are broadly applicable and enable characterization of the initial properties of a coating and their evolution in service.

SURFACE ENHANCEMENTS & COATINGS

Effect of Long-chain Branching on Scratch Behavior of Polypropylene



Dr. Sue,
Professor, Texas A&M University

Incorporation of long-chain-branched (LCB) fractions is known to be effective in enhancing the melt strength of PP for demanding manufacturing processes, such as blow molding, thermal forming and foaming. In this study, the effect of LCB on the scratch behavior of a set of model PP systems has been investigated using the ASTM D7027/ISO 19252 standardized scratch test method, followed by quantitative microscopy analysis. Evaluations were based on the onset loads for scratch visibility, fish-scale formation and scratch depth measurements. It is found that LCB can improve the resistance against scratch-induced visibility by 40%, delay the onset of fish-scale formation by 35%, and lead to a much shallower scratch depth. Correlation between scratch behavior and the of LCB-PP material parameters has been established.

Experimental Observation and Numerical Modeling on Mar Behavior of Amorphous Polymers



Shuoran Du,
Ph.D. Student,
Texas A&M University

Mar is a type of subtle surface damage caused by a sliding object barely visible to human eyes. This minor damage phenomenon has rarely been systematically studied. In this presentation, mar behavior of a series of model amorphous polymers, i.e., PMMA, PC, and PS, were investigated based on a modified ASTM/ISO scratch testing methodology and a corresponding finite element methods (FEM) modeling. Furthermore, mar damage and material parameter relationship were established through a systematic FEM parametric study. Based on the above findings, a set of mar damage criteria are proposed. Strategies for improving mar damage resistance of polymers are introduced based on material constitutive behavior and surface property of the polymer.

Tuning the Haptic Profile of Soft-touch Waterborne Coatings with Organic Matting Agents and Feel Additives



Dr. Xiangyi Zhang,
Senior Chemist,
Edwin Nungesser,
Research Scientist,
Dow

Superior haptic and aesthetic properties are key attributes that automotive manufacturers rely upon to differentiate their brands. When properly formulated, matte soft-touch coatings can provide a significant aesthetic and haptic upgrade to surfaces. This work demonstrates the use of matting agents and feel additives to tune the haptic performance of waterborne coatings on flexible substrates. Using analytical tools, a sensory landscape is generated by measuring multiple surface characteristics such as friction, texture, and tack. This provides a knowledge base to build a correlative model between material properties and haptic performance.

Advances in Commercial Technology for Scratch & Mar Resistance in TPO Compounds



Mike McCormack,
S&D Business Unit Manager,
AESSE Sales & Distribution

Javachem®HG-600 is a specialty additive that imparts efficient scratch & mar resistance to the surface of automotive interior parts, including dashboards, door trim, center consoles, pillar trim and other PP and TPO auto-body parts. It contains a special functional group and imparts excellent and long-lasting scratch resistance without stickiness and yellowing after exposure to light at high temperature. It can also effectively avoid stress whitening problems that normally exists when scratch resistance agents are used.

This paper will discuss the structure and performance of silicone chemistry, the mechanisms of scratch & mar, how the anchoring effect of Javachem®HG-600 differentiates it from other technologies and allows excellent surface properties without additional exudation and stickiness. Supporting test data will be presented as well as commercial successes

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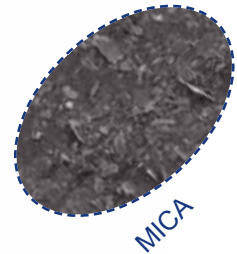
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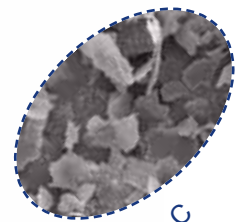
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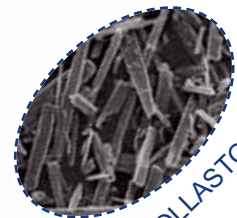
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BIO BASED & RECYCLED MATERIALS

SESSION CO-CHAIRS:

Susan Kozora, IAC Group • Dr. Alper Kiziltas, Ford Motor Co.

Effect of Water Absorption on Mechanical Properties of Recycled Thermoplastic Composite Materials

Dr. Sandeep Tamrakar,
Research Associate,
Ford

Recyclability of natural fiber and glass fiber reinforced polypropylene composites and glass fiber reinforced nylon composites have been studied through injection molding and mechanical grinding. Mechanical properties of virgin and recycled composites were assessed through flexural, tensile and impact tests. No significant degradation in mechanical properties of natural fiber composites was observed after several rounds of recycling. However, severe degradation in mechanical properties was observed for glass fiber composites. For instance, after five cycles of recycling, only 59% of flexural strength and 64% of flexural modulus was retained for glass fiber reinforced nylon composite, which is mainly due to attrition in the length of glass fibers after subsequent recycling. Water absorption tests conducted at room temperature showed no effect on any of the natural or glass fiber reinforced polypropylene composite. However, nylon composites absorbed about 8% water before reaching saturation point after 45 days of immersion.

Biocarbon- A Renewable and Lightweight Functional Filler for Polymer Composites

Ayşe Ademagavun,
Materials Technical Professional,
Varroc Lighting System

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

Why a New Generation of Bio Based Olefinic Materials are Required for Tomorrow's Vehicle Interior



Dr. Sassan Tarahomi, Chief
Technology Officer, Alterra Holdings

Future vehicles require stronger, lighter and cost effective materials. Current bio based materials barely meet the existing material specifications or component performance requirement and cost more. Customer base is changing and they want bio based materials to be used in their vehicles. A dilemma for automotive OEMs and an opportunity for the bio based resin producers. Developing a new generation of stronger, cost effective bio based resins to meet the future vehicle performance will end this dilemma.

Improving the Properties and Durability of Recycled Automotive Plastics Bringing New Life by Restabilization

Nancy Cliff, Senior Scientist II, BASF

The goal of a circular economy, where plastics are recovered and recycled, is admirable, necessary, and challenging. There are many difficulties associated with the recycling of automotive TPO and TPE components, including the harvesting of the polymeric components, contamination of the material with both metals and paint, variations in polymer composition, and the presence of various fillers and pigments. Besides these challenges, it is virtually certain that the recycled polymer will have undergone both thermal and photo-oxidation chemistry, resulting in a polymer that has different - and usually inferior - properties than the virgin material. Even if only a portion of the new part is composed of partially degraded recycled material, the properties of the entire composition can be affected in terms of both initial and long-term (durability) performance. Contributing to this is the fact that any thermal and light stabilizers used in the original article will also be at least partially depleted.

In this paper we will demonstrate that by compensating for the depletion of the original stabilizers, it is possible to improve both the initial properties after processing, and long-term properties, such as thermal and photo stability, of the recycled material.

BIO BASED & RECYCLED MATERIALS

Breakthrough Developments in Functional Fillers



Chris DeArmitt Ph.D.
FRSC CChem, Technical Director
Kish Company,
Arctic Minerals

Functional fillers are essential additives used to enhance the properties of plastics and to impart new functionality. Although such fillers are established in the marketplace, new developments continue to push the envelope. This talk outlines a series of truly new developments that provide new opportunities for compounders and OEMs alike. These include a new amorphous fiber reinforcement wollastonite replacement, a high aspect ratio mica providing weight reduction compared to talc and a new ferric oxide high density filler. As well as the developments in materials, we present news about improved manufacturing, safety and surface treatment of fillers for plastics. These include sub-micron and size fractionated fillers for improved impact resistance, a range of crystalline silica "free" fillers and a new continuous process for surface treating fillers with organosilanes. The new manufacturing process enables bulk treatment of minerals at lower cost than previously possible, making surface treatment affordable at last.

Circular Economy New Challenges and Opportunities for the Plastic Industry: A Polyolefin Producer Approach



Daniel Bahls Pierera,
Business Growth Manager,
Borealis

Circular Economy is now on top of the agenda of many discussions, influencing political decisions, societal behaviour and consequently industrial strategy. As in other industries, the circular economy is also picking up speed in the automotive world. While there is some experience with using post-industrial recyclates already, there are several challenges related to a more extensive use of recycling material, especially from post-consumer sources. Borealis is eager to support the circular transition also in the automotive industry and aspires to offer a wider range of innovative recycling solutions, including recycled materials enhanced with fillers, and tailor-made post-consumer waste based compounds. In 2018, two of these solutions were used in several parts for a specially built Volvo XC60 T8 plug-in hybrid SUV at the Ocean Summit event in Gothenburg, Sweden. Borealis invites partners to a dialogue in order to accelerate the transition to a circular automotive industry.



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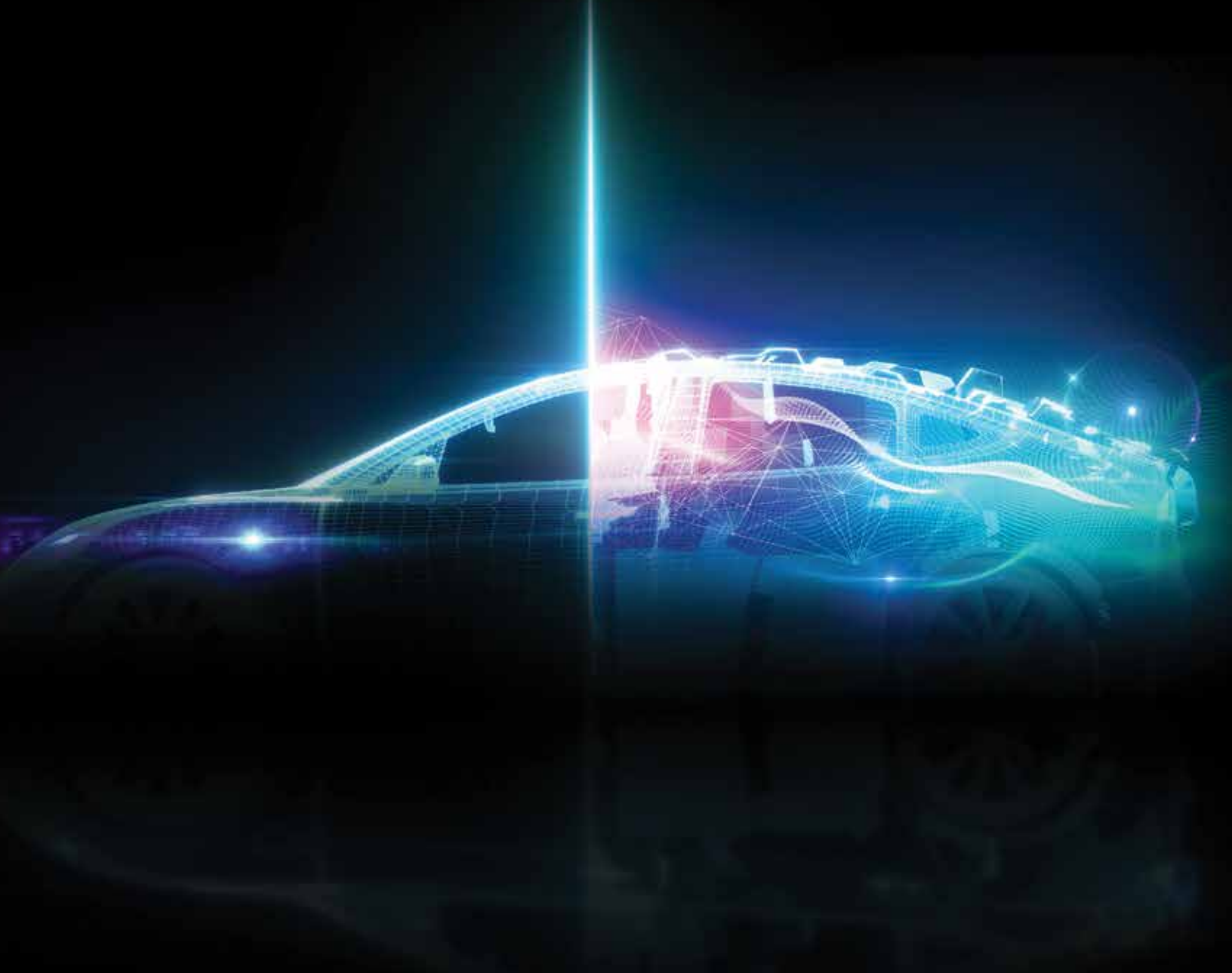
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