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Innovation Day Poster Session Guide

September 8, 2025

Poster Session, 10:10 AM – 11:15 AM

On Innovation Day emerging industry leaders celebrate today's innovations in the chemical industry and seek solutions for tomorrow's challenges. By taking early-career scientists out of the lab and giving them broader access to their colleagues and to the historical and social context of their research, Innovation Day supports a 21st-century chemical enterprise that addresses society's most pressing needs. Cohosted by the Society of Chemical Industry (SCI) and Science History Institute since 2004, Innovation Day 2025 is a hybrid event held in person and online on September 8. In its 22nd year of highlighting breakthroughs and achievement in innovation, our program continues to attract leading speakers and participation from across all sectors of the chemical enterprise.

Innovation Day 2025 features 19 posters. The themes of this year's event explore Sustainability & Profitability and Modern Innovative Productivity Tools/Speed to Market.

This Poster Session Guide is organized alphabetically by poster presenter last name. The Guide includes poster presenter name(s), poster authors (when available), company affiliation, and poster title and abstract for each poster. Please use this as a guide to explore posters that will be on display at this year's Innovation Day program.

For full poster citations, please contact the poster presenters.

Organized by Presenter Surname

Presenter Name(s): Olivier Catherine
Company: ExxonMobil
Poster Title: Optimizing Stretch Film Performance with Tailored Polyethylene Formulations
Abstract: Stretch film is a widely adopted solution for pallet unitization, offering secure and efficient transportation with minimal material usage. This poster explores how performance polyethylene formulations can be engineered to deliver targeted film properties for specific wrapping applications. Two key attributes are highlighted and discussed through compelling practical film design examples:

1. **High Holding Force** – ideal for films used in power pre-stretch wrapping systems, ensuring load stability during transit.
2. **High Tenacity** – enhancing the effectiveness and durability of hand-applied films.

Presenter Name: Luke Galuska
Company: ExxonMobil
Poster Title: Test methodology to accelerate polymer processing aid development
Abstract: Within blown film extrusion, polymer processing aids (PPA's) are commonly incorporated into polyethylene resins to reduce extrusion pressure and mitigate melt fracture, allowing for higher production rates. These additives migrate to the die exit and create a lubrication layer, thereby reducing stress on the polymer melt. Recently, traditional fluoropolymer-based PPA's are now under regulatory scrutiny resulting in a push to develop alternative PPA chemistries to meet market demands. However, achieving fluoropolymer PPA performance is no easy task, and many methods provide either insufficient differentiation of PPA performance or are irrelevant to real-world applications. As such there are numerous alternative PPA chemistries in the market resulting in burdensome testing across the value chain. Thus, there is a need to utilize a testing methodology which provides PPA differentiation and enables speed to market. This poster will discuss PPA fundamentals and subsequent testing methodology which has been demonstrated to differentiate PPA performance.

Presenter Name(s): Margaret Gerthoffer
Company: DuPont
Poster Title: Intuitive Polymer Design of Medical Adhesives
Abstract: Advanced medical grade adhesives are formulated to balance immediate adhesion to skin, sustained wear-time, and atraumatic removal from skin. Herein, we will discuss recent advancements of a multigenerational technology platform for the growing wearables and advanced wound care market. This project supports Liveo™ medical grade adhesives by offering two unique polymer concepts that enable one-part solvent free formulations, ubiquitous sterilization options, non-toxic/non-sensitizing formulations, and firm anchorage to skin. The offered formulations are both tunable to wound-care applications that require atraumatic removal (SiloGel silicone:organic hybrid material) and medical device applications that require long-term wear (copolyesters).

Presenter Name(s): Jesse Hellums, Susie Wu
Company: Trecora
Poster Title: Trecora: From Lubricant Additive to Sulfide-Based Solid Electrolyte Component – P_2S_5
Abstract: Trecora's poster examines the chemical role of phosphorus pentasulfide (P2S5) in the

development of sulfide-based solid electrolytes (SSEs) for solid-state lithium batteries. P2S5 is a key precursor in the synthesis of lithium thiophosphates such as Li_3PS_4 and Li_6PS_5Cl, which form the basis for SSEs exhibiting high ionic conductivity and electrochemical compatibility with lithium metal.

We compare structural classes of SSEs (glass, crystalline, and composite) derived from P2S5 and evaluate their ionic transport properties. Particular attention is given to challenges in synthesis and handling, including P2S5's high reactivity with moisture, which can result in hydrolysis and H_2S release. Strategies for improving interfacial stability and suppressing lithium dendrite formation such as halide doping and oxide coatings are also discussed.

Given the stringent material requirements for SSBs, the poster highlights the importance of a consistent, high-purity P2S5 supply. Domestic production capabilities are positioned as essential to supporting scalable SSE development and accelerating commercial viability.

This work connects the molecular chemistry of P2S5 with emerging applications in advanced energy materials, providing a foundation for further exploration of solid electrolyte design and integration.

Presenter Name: Steve Henning
Company: Trinseo
Poster Title: Trinseo's PC Dissolution Technology: Enabling Circularity in High-Performance Plastics
Abstract: Trinseo has developed a proprietary dissolution-based recycling platform to address the challenges of end-of-life polycarbonate (PC) waste. Unlike mechanical recycling, dissolution is a physical purification process that retains the polymer's chemical structure while removing contaminants, additives, and non-PC materials such as metals and other polymers. This enables the recovery of high-purity recycled PC (rPC) suitable for demanding applications in automotive, electronics, and construction.

The process eliminates the need for labor-intensive sorting and dismantling, allowing whole parts like front lights and building sheets to be processed directly. Advanced variants enable molecular repair and upcycling of degraded PC, transforming previously landfilled or incinerated waste into high-value materials.

Trinseo's pilot facility in Terneuzen, Netherlands, inaugurated in April 2023, demonstrates the scalability of this technology. The company also secured a U.S. patent for its dissolution recycling method in July 2024, reinforcing its leadership in sustainable innovation.
By integrating dissolution into its sustainability strategy, Trinseo aims to reduce reliance on virgin PC, lower carbon emissions, and support circularity across its engineered materials portfolio.

Presenter Name: Cassandra Hill
Company: Quaker Houghton
Poster Title: Formulating Bio-Based RPOs for Sustainability, Performance, and Cost
Abstract: Replacing hazardous, finite petrochemical oils and solvents in rust preventative oils (RPOs) with safer, renewable bio-based alternatives is essential for sustainability — but it comes with serious challenges. Bio-sourced ingredients are often significantly more expensive and behave differently, making simple substitution unfeasible. With thousands of RPO formulations in use and each customer demanding unique performance and price points, one-size-fits-all reformulation isn't an option. We tackled this complexity using Design of Experiment (DoE) to build predictive models and response surface maps from a limited number of test formulations. This approach allows rapid, data-driven

optimization of RPO formulations — reducing time, cost, and uncertainty — while enabling tailored, sustainable solutions at scale.

Presenter Name: Jon Hunt
Company: Arkema
Poster Title: First Subverter, Now the Standard
Abstract: Dental models are used in many dental applications including implant creation, pre-surgery inspections, and thermoforming for dental aligners. Traditional dental models create a replica of the patients' teeth using impression material and plaster casting. This method can be messy and uncomfortable for the patient, as well as slow and labor intensive for dental labs. Digital Light Processing (DLP) 3D printing can be utilized in numerous dental applications, creating an alternative manufacturing process with quick turnaround, high throughput, and high accuracy, which increases patient satisfaction. This method uses UV photoreactive liquid resin and free radical polymerization to rapidly create custom parts with complex geometries that traditional manufacturing methods have difficulties producing. In addition to satisfied dental appliance wearers, 3D printing of dental materials can bring exceptional returns to dental practice revenue. Dental models must be extremely accurate, so appliances fit, and surgeries go seamlessly. Sartomer designs and supplies (meth)acrylic oligomers, monomers, crosslinkers, to create accurate dental models. An Arkema core focus is sustainability and our Sarbio® lineup of materials utilizes biobased feedstock to help reduce carbon emissions.

Presenter Name: Stacy Jordahl
Company: ExxonMobil
Poster Title: Vistamaxx™ Performance Polymers: Enhancing Material Performance in Flexible Packaging
Abstract: This abstract examines the primary advantages and uses of Vistamaxx™ performance polymers for enhancing material performance in flexible packaging. Vistamaxx™ performance polymers, developed by ExxonMobil, are semi-crystalline polyolefins with tunable amorphous and crystalline content imparting unique polymer attributes in applications. Performance attributes of interest in flexible packaging applications include sealability, toughness, cling, elasticity, clarity, and flexibility. Besides, Vistamaxx™ performance polymers can act as a compatibilizer between polyethylene and polypropylene by enhancing the compatibility of polyolefinic materials through improvement of interfacial adhesion and dispersion. In summary, the molecular design of Vistamaxx™ performance polymers allow it to serve as an excellent sealant and toughness enhancer in flexible packing as well as a compatibilizer to improve the properties of products containing a blend of PP and PE.

Presenter Name: Samantha Lauro
Authors: Samantha Lauro, Paul Brigandi, Saurav Sengupta, Christopher Harris
Company: Dow Inc.
Poster Title: Turning Trash into Treasure: PCR in Wire & Cable Jackets
Abstract: Plastic enables cheap, efficient, protective packaging for consumer goods, but often ends up in landfills once it has served its initial purpose. Dow has committed to STOP THE WASTE by enabling 1 million metric tons of plastic to be collected, reused or recycled through its direct actions and partnerships by 2030. As part of this commitment, Dow has developed REVOLOOP™ Recycled Plastics Resins, a line of high-quality products enabling the use of post consumer recycled (PCR) resin across multiple applications. This presentation focuses on the evaluation, development and use of PCR materials in wire & cable applications, turning consumer waste polyethylene into an easily processable, durable jacket layer for

protecting power and telecom cables. Consumer waste is sorted, cleaned, and processed into PCR resin pellets, and formulated into cable jacket compound. Incorporating 30% PCR into cable jackets results in reduced environmental impact, while maintaining equivalent or more desirable rheological and mechanical properties, all wrapped up into a single-pellet solution to simplify customer inventories.

Presenter Name: Abby Miller
Company: Arkema
Poster Title: Self-Crosslinkable PVDF/acrylic hybrid Technology
Abstract: Poly (vinylidene fluoride) (PVDF) has been used in architectural coatings over metal for decades because of its excellent weathering performance. More recently, hybrid resin dispersions of PVDF/acrylic were developed by Arkema to bring the excellent PVDF coating performance to other substrates (composites, glass, polymers, wood, etc.) because a high temperature bake was no longer required. Isocyanate crosslinking can be used to improve the chemical resistance and hardness of these PVDF-based coatings; however, micro-foaming is an issue with the use of isocyanates, and they pose a respiratory risk for applicators. Therefore, a new self-crosslinkable PVDF/acrylic hybrid was recently developed, delivering comparable performance as isocyanate-crosslinkable resins, without foaming and hazard concerns. This technology ensures the same great weatherability as other PVDF/acrylic hybrid resins, while having additional benefits of improved solvent resistance and even lower volatile organic compound emissions.

Presenter Name: Manoj Nerkar
Company: Dow Inc.
Poster Title: Enabling recycling of Polyvinyl Butyral (PVB) from automotive windshield
Abstract: Polyvinyl butyral (PVB) is widely used in laminated glass for architectural and automotive safety applications, notably windshields. Its adhesive properties bind glass layers, holding fragments together after breakage and reducing injury risk. When vehicles reach end-of-life, windshield glass is separated from PVB, enabling recycling. However, recycled PVB presents challenges during melt processing due to its tendency to adhere to metal surfaces, complicating recycling. This study evaluated the feasibility of recycled PVB removed from glass, focusing on improving its processability and performance. Incorporating acrylic additives during melt processing prevented PVB from sticking to metal surfaces, significantly enhancing handling. Additionally, these additives improved the mechanical properties of recycled PVB, such as indentation resistance and rigidity, making it suitable for applications like flooring. Acrylic modification offers the potential to divert over 100,000 lbs. of PVB from landfills annually, adding value to recycled materials and promoting complete windshield recycling. This approach not only advances sustainability in automotive recycling but also expands the potential uses for recycled PVB. Technology is the winner of the Edison award 2024 and was also featured in Plastics News.

Presenter Name: Alexander Nieuwland
Company: Eastman
Poster Title: Helium Conservation in Analytical Laboratories: A Complete-System Strategy
Abstract: Helium is a critical, non-renewable resource whose price volatility and recurring shortages threaten both operating budgets and applications such as gas chromatography (GC), X-ray fluorescence (XRF) spectroscopy and differential scanning calorimetry (DSC). While technological advancements have helped decrease industry reliance on helium through the use of alternative gases, many analytical labs will continue to depend on helium for the foreseeable future, making conservation imperative.

This poster presents a “complete-system” framework that has reduced net helium usage in every lab it has been applied without compromising data quality or throughput. The approach integrates four mutually reinforcing pillars:

1. Measurement & Reconciliation
   • Compare calculated (instrument-specific) demand with total cylinder or bulk helium delivery.
   • Identify discrepancies and locate leaks using targeted pressure-decay and leak testing.
2. Gas Substitution
   • Implement hydrogen or nitrogen as the GC carrier gas where infrastructure and method validation support the switch.
   • Replace helium with nitrogen as the make-up gas on flame ionization detectors (FIDs) if nitrogen gas is available.
3. Software Changes
   • Enable Gas Saver in GC methods with high split ratios to reduce split vent flows after the injection has been completed.
   • Implement standby methods that minimize helium consumption further when the instrument is not in use.
4. Real-Time Consumption Analytics
   • Install wireless digital flow meters and data dashboards to visualize usage.
   • Generate automated alerts when consumption deviates from statistical baselines.

Taken together, these interventions deliver rapid payback, enhance business continuity, and advance institutional sustainability goals. The framework is scalable—from single-instrument labs to multi-lab systems—and can be adopted incrementally, allowing every helium user to capture immediate savings while preparing for a resource-constrained future.

Presenter Name: Justine Paul
Company: DuPont™ Vespel®
Poster Title: Vespel® Polyimide Parts for xEV Automotive Applications
Abstract: DuPont™ Vespel® polyimide parts are engineered for the evolving requirements of electric vehicles (xEVs),focusing on the need for lightweight and durable materials that can withstand significant thermal and mechanical stresses. As the automotive industry transitions to electrification, Vespel® materials show exceptional performance in high-pressure velocity (PV) situations. This performance is particularly evident in e-axle and battery systems, due to their excellent electrical insulation properties. These polyimide components effectively reduce wear and friction while maintaining structural integrity in extreme temperatures, making them ideal for components such as thrust washers, seal rings, and bushing applications. Additionally, Vespel® parts exhibit excellent performance under lean lubrication conditions, contributing to the longevity and reliability of automotive systems. As the automotive landscape progresses, DuPont™ Vespel® polyimide materials facilitate advancements in xEV technology, effectively addressing the rigorous requirements of contemporary automotive applications.

Presenter Name: Mayuri K. Porwal and Jesse H. Hsu
Company: DuPont
Poster Title: Materials for Displays Applications
Abstract: Polyimides are highly sought materials for various displays applications. Their high thermal and chemical stability makes them well studied and suited for flexible top emission display substrate applications. However, current OLED display applications require colorless polyimides given the market's interest in flexible and bezel-free full display smartphones. There are a number of strategies that may be

used to obtain clear polyimides, however, balancing low optical with high thermal and mechanical properties is significantly more challenging. Our latest development of colorless polyimides for flexible displays applications will be discussed.

Presenter Name: Athreya Suresh Babu
Company: ExxonMobil
Poster Title: Exxtend™ for Advanced Recycling
Abstract: Plastic waste is a significant global challenge, with at least 3 billion people lacking access to controlled waste disposal facilities. ExxonMobil recognizes the value of plastics and shares society's concerns about their environmental impact. To address plastic waste at a meaningful scale, ExxonMobil is actively scaling up advanced recycling technology that can complement traditional recycling technologies like mechanical recycling. While mechanical recycling is familiar and practical for homogenous plastic waste, it faces limitations with mixed or contaminated plastics and reduces plastic durability over time. Advanced recycling, including our proprietary Exxtend™ technology, offers a solution by breaking down hard-to-recycle plastics into raw materials for new products. This process supports the creation of certified-circular polymers with ISCC PLUS Sustainability Declarations, aligning with customers' goals for plastic circularity. Our Baytown, Texas facility, one of the largest in North America, successfully runs advanced recycling, and we plan to deploy this technology globally. Through these efforts, ExxonMobil is committed to transforming plastic waste into valuable resources and contributing to a sustainable future.

Presenter Name: Vincent Terrone
Company: ExxonMobil
Poster Title: Compositional effects of Vistamaxx™ performance polymers on thermoplastic polyolefin (TPO) compounds with PP/PE recyclate incorporation
Abstract: The automotive market is increasingly seeking light weight components with an ambition to seek improved performance and profitability. Thermoplastic Polyolefin (TPO) compounds offer extraordinarily tough components that are durable and can contribute to lightweight finished vehicles. Bumper covers, fascias, door panels, and instrument panels are common rigid vehicle parts made from TPO compounds. Incorporating mixed polyolefin (PO) recyclate into TPO compounds is a growing industry trend. PO recyclate incorporation can potentially improve profitability by reducing the weight of virgin polyolefin polymers required in traditional automotive TPO compounds.
The challenge is that incorporation of PO recyclate can negatively impact several mechanical properties that are important to application end use performance.
ExxonMobil Technology and Engineering Company has undertaken application development testing that indicates Vistamaxx™ performance polymers, a semi-crystalline propylene based elastomer, can help enable incorporation of PO recyclate in automotive TPO compounds while enhancing mechanical properties important to application end use performance.

Presenter Name: Helen Wang
Company: Trinseo
Poster Title: Advancing PMMA Circularity Through Depolymerization – Trinseo’s Innovation
Abstract: Trinseo has developed an advanced chemical recycling process to depolymerize polymethyl methacrylate (PMMA), transforming end-of-life acrylic products back into high-purity methyl methacrylate (rMMA). This process enables the recovery of PMMA from diverse waste streams, including

materials that are difficult to recycle mechanically. The regenerated rMMA matches the quality of virgin MMA, making it suitable for demanding applications like automotive taillights and caravan windows.
The depolymerization pilot facility, launched in Rho, Italy in 2024, operates on a continuous recovery model, ensuring scalability and efficiency. It complements traditional mechanical recycling by removing legacy additives and impurities, thus expanding the range of recyclable PMMA materials.
This innovation supports Trinseo's broader sustainability goals, contributing to a circular plastics economy and reducing reliance on fossil-based raw materials. Combined with in-house sourcing and treatment via its Heathland operation, Trinseo's approach offers a high-performance, sustainable solution for the acrylic value chain.

Presenter Name: Lewis C. Wilkins
Company: ExxonMobil
Poster Title: Phosphorus and Antimony Complexes in Metallocene Activation: Forays into Catecholato Pnictogen Compounds and Ligand Lability
Abstract: Traditionally, metallocenes are activated by either MAO, group 13 compounds, or discrete activators featuring an ammonium salt to liberate the active metallocene ready for olefin binding and polymerization. To date, there has been a dearth of work into group 15-centered molecules in similar activation pathways. Herein, activators based on highly Lewis acidic, neutral stiboranes and their implementation in activation is described alongside the use of anilinium phosphates as weakly coordinating anions (WCA). While these pnictogen compounds do indeed activate the metallocene metal center, rapid ligand exchange occurs yielding previously undescribed μ-1,2-catecholato dinuclear zirconium complexes.

Presenter Name: Young Jun Yoon
Company: ExxonMobil
Poster Title: Enabling Tailorable Optical Properties and Markedly Enhanced Stability of Perovskite Quantum Dots by Permanently Ligating with Polymer Hairs
Abstract: Instability of perovskite quantum dots (QDs) toward humidity remains one of the major obstacles for their long-term use in optoelectronic devices. Herein, a general amphiphilic star-like block copolymer nanoreactor strategy for in situ crafting a set of hairy perovskite QDs with precisely tunable size and exceptionally high water and colloidal stabilities is presented. The selective partition of precursors within the compartment occupied by inner hydrophilic blocks of star-like diblock copolymers imparts in situ formation of robust hairy perovskite QDs permanently ligated by outer hydrophobic blocks via coprecipitation in nonpolar solvent. These size- and composition tunable perovskite QDs reveal impressive water and colloidal stabilities as the surface of QDs is intimately and permanently ligated by a layer of outer hydrophobic polymer hairs. More intriguingly, the readily alterable length of outer hydrophobic polymers renders the remarkable control over the stability enhancement of hairy perovskite QDs.