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Contact: Teri Chouinard CBC, APR, SPE Automotive MarCom Chair 248.701.8003 intuitgroup@gmail.com

SPE® AUTOMOTIVE NAMES WINNERS FOR 53RD ANNUAL AUTOMOTIVE INNOVATION AWARDS PROGRAM

TROY, (DETROIT), MICH. – The Automotive Division of the Society of Plastics Engineers (SPE®) today announced the winners for its 53rd annual **Automotive Innovation Awards Program**, the oldest and largest recognition event (established in 1970) in the automotive and plastics industries. The announcement was made on the evening of November 13, 2024, USA.

The Process/Assembly/Enabling Technologies Category winner is also this year's Grand Award winner. The Grand Award winner is selected from the winners of each of the ten categories by a panel of Blue Ribbon Judges who are industry experts. This year's winners are:

**GRAND AWARD & CATEGORY WINNER: Process/Assembly/Enabling Technologies
Front Seat Back and Cushion Frames**

OEM Make & Model: 2024MY Toyota Motor Company Toyota Tacoma

System Supplier:	Adient
Material Processor:	US Farathane
Material Supplier:	BASF
Resin:	Ultradid B3ZG7 CR, B3ZG10 PA6
Tooling Supplier:	Delta Technologies Inc.
Process:	Injection Molding

This first known adoption of resin shock mounts in vehicle seats allows for dynamic lateral, vertical, and horizontal movement to isolate occupants during off-roading. Molded from PA6 grades formulated for the application, the airbag-compatible front seat resin frame – a Toyota first – integrates ten components, including insert-molded side airbag attachments, ball joint mounts, and lumbar mat connections, to reduce complexity and eliminate the need for 10-20 additional parts. Insert-molded nuts and wire harness attachments in the seat cushion frame streamline production. The design improves ride comfort, cuts mass and cost, and supports future adaptability, all while meeting safety and performance standards.

**CATEGORY WINNER: Aftermarket and Limited Edition/Specialty Vehicles
E-bus Battery Pack Housing**

OEM Make & Model: 2024MY Bluebus 12m e-bus

System Supplier:	Simona AG
Material Processor:	Simona AG
Material Supplier:	SABIC
Resin:	STAMAX FR30YH611 LGF PP
Process:	Sheet Extrusion

This thermoplastic-intensive battery pack with 240 kg of plastic per vehicle is the first known globally to provide enhanced fire resistance in electric bus applications. It offers 30% weight savings compared to metal solutions. An intumescent flame-retardant PP prevents thermal runaway by forming a protective char, giving occupants more time to evacuate in the event of a fire. The pack maintains cold side temperatures below 250°C to prevent carpet ignition, while providing structural integrity through its integration with wood and metal components. This solution improves safety and reduces heat transfer, outperforming aluminum enclosures in which flames break through almost instantly.

CATEGORY WINNER: Body Exterior**Self Adjusting Fastener Sleeve**

OEM Make & Model: 2024MY General Motors Co. Chevrolet Equinox EV

System Supplier:	ADAC Automotive
Material Processor:	Witol Automotive
Material Supplier:	BASF
Resin:	Ultramid B3WG10 PA6 GF50 PA6
Tooling Supplier:	Witol Automotive
Process:	Injection Molding

Sleeve for flush exterior door handles eliminates manual adjustments and specialized tools, enabling dimensional fit-up to class A surface in all directions while using standard hex-head fasteners, an industry first. The innovative design integrates a metallic sleeve inside a snap-fit clamshell PA6 housing, allowing for real-time adjustments during assembly. The solution reduces labor time by 2-3 minutes per handle, saving up to 12 minutes per vehicle. The metallic sleeve provides load-bearing stability, and the design fits seamlessly with existing GM fasteners, avoiding costly rework or changes to fastener types. This approach improves efficiency while reducing metal parts and plastic straps.

CATEGORY WINNER: Body Interior**Rear Storage Panels**

OEM Make & Model: 2024MY Toyota Motor Company Toyota Tacoma

System Supplier:	Vuteq Corporation
Material Processor:	Vuteq Corporation
Material Supplier:	BASF
Resin:	Ultramid B3GM35 Q649 PA6 (GF15+M25) B3WGM24 HPX BK23210 PA (GF10+M20)
Tooling Supplier:	Integrity Tool and Mold de México
Process:	Injection Molding

This world-first design for the Toyota Tacoma's 1350 x 465 mm rear storage panel meets challenging performance requirements, including sub-zero impact resistance (-30°C), 12,000 fatigue cycles, and thermo-cycle performance without permanent deformation. With four grain patterns, it includes a single painted handle for ease of use, and the inner and outer shells are mechanically fastened at 34 locations. Utilizing a 20% mineral and 10% glass-filled polyamide improved flow by 23%, reducing clamp tonnage and expanding the processing window. This innovative solution achieves a 0.5 mm dimensional tolerance, ensures durability, and eliminates concerns of cracking or deformation under load.

CATEGORY WINNER: Chassis/Hardware**Half Shaft Rear Axle Diaphragm Boots**

OEM Make & Model: 2024MY Ford Motor Co. Ford E-Transit

System Supplier:	Neapco
Material Processor	INSIT Group
Material Supplier	Celanese
Resin:	Hytrel HTR8745LV TPC-ET
Tooling Supplier:	INSIT Group
Process:	Injection Molding

Injection-molded diaphragm boots for the Ford E-Transit replace press blow-molded designs, delivering a 15% weight reduction and 17% material savings. Their design also enables higher angulation and longer plunge than other products in the market. The innovative use of high MFR and low viscosity resin ensures high flex fatigue resistance, essential for half shaft systems where each turn adds stress. The design allows for a 50% reduction in grease usage, improved joint lubrication, and lower operating temperatures. Mold filling simulation eliminated defects such as air traps and weld lines, producing injection molded parts with superior durability and productivity.

CATEGORY WINNER: Electric and Autonomous Vehicle Systems
High Voltage Battery Module Busbar

OEM Make & Model: 2025MY Ford Motor Co. Ford E-Transit

System Supplier:	Kyungshin Corporation
Material Processor:	Kyungshin Corporation
Material Supplier:	SABIC
Resin:	Sabic PP Compound H1030 FR PP
Process:	Injection Molding

Leveraging intumescent flame-retardant PP, this high-voltage busbar protection provides 15% weight savings, and 35% cost reduction compared to traditional solutions. The material's unique properties allow it to expand from 2.8 mm to 5 mm when exposed to temperatures up to 200°C, boosting thermal resistance and preventing arcing in high-nickel battery chemistries. This enhanced protection ensures the dielectric strength remains intact, even in extreme conditions. Injection molded for precision, the design also improves manufacturability and reduces tooling costs. With a maximum operating temperature of 75°C, it delivers superior safety for EV battery packs and supports long-term reliability.

CATEGORY WINNER: Materials

EGR Cold Tube / Diffuser

OEM Make & Model: 2023MY Ford Motor Co. Mustang, Explorer, Escape, Ranger, Bronco, & Maverick

System Supplier:	Sogefi Group
Material Processor:	Viking Plastics
Material Suppliers:	Envalior
Resin:	Xytron G4024T PPS GF40
Tooling Supplier:	Viking Plastics
Process:	Extrusion

Replacing stainless steel with thermoplastic, this EGR cold tube diffuser achieves a 15% weight savings and integrates directly into the air intake assembly, eliminating three fasteners and multiple brazing operations. Designed to withstand a severe acid environment with pH levels of 2.2 and temperatures up to 200°C, the thermoplastic material offers superior chemical resistance compared to stainless steel. The diffuser handles NVH requirements, enduring 8G acceleration, while maintaining structural integrity. This design simplifies assembly, reduces part complexity, and significantly cuts costs. Its durability and chemical resistance in extreme environments ensure long-lasting performance, setting a new standard for EGR system efficiency.

CATEGORY WINNER: Powertrain

Plastic Coolant Hub

OEM Make & Model: 2025MY Ford Motor Co. Ford OEM Make & Model: Mustang Mach E

System Supplier:	Cooper Standard Automotive
Material Processor	Viking Plastics
Material Supplier	Celanese
Resin:	Zytel 70G30 HSLR BK186LM PA66 GF Zytel 70G13 HS1L NC010 PA66 GF
Tooling Supplier:	MPP Corporation
Process:	Insert Injection Molding

Integrating multiple tubes, fittings, and connectors into a single, compact manifold, this hub improves EV coolant system efficiency, reducing tubing length by 1.23 meters and eliminating eight quick connects, six tee/wye adaptors, and three additional adaptors. System weight is reduced by up to 5% and coolant pressure drop is decreased, improving overall system performance. The laser-welded hub includes three injection-molded components that form a leak-tight structure and incorporates a pressure-balancing orifice. With 30% fewer connections, the design achieved a 50% reduction in packaging space while removing 29 tube insertions and six tube forming processes for assembly savings.

CATEGORY WINNER: Safety
Busbar Cable Support Bracket

OEM Make & Model: 2025MY General Motors Co. Cadillac CELESTIQ

System Supplier:	Grand Traverse Plastics
Material Processor	Grand Traverse Plastics
Material Supplier	Celanese
	Syensqo
Resin:	Celanex 3316 EF 3022 N PBT
	Ryton R-4-220BL PPS
Tooling Supplier:	Quest Industries
Process:	Injection Molding

Designed to prevent thermal runaway and high-voltage arcing by minimizing cable motion, the bracket uses high-performance V0-rated PPS and PBT materials to eliminate a metallic retention feature and provide reliable support. Isolating the 15 kg busbars enhances safety and durability. The snap-fit design provides over 240N of axial retention force with a single fastener per location, reducing the need for more than 10 fasteners per RESS. The ergonomic installation, requiring only 45N of insertion force, reduces assembly time and scrap costs by up to 99%, improving overall production efficiency while maintaining high-voltage safety standards.

CATEGORY WINNER: Sustainability
Exterior Cladding with Living Hinge

OEM Make & Model: 2024MY Rivian Automotive, LLC Rivian R1T & R1S

System Supplier:	KB Components
Material Processor:	KB Components
Material Supplier:	Advanced Composites
Resin:	ADX2361 TPO (PCR)
Tooling Supplier:	Aalbers Tool & Mold
Process:	Injection Molding

Combining a 1000 mm long living hinge and 30% PCR TPO, this MIC A-class exterior cladding consolidates 12 parts into 4 and eliminates 36 metal fasteners per vehicle. The thin-walled part achieves tight tolerances, color match, and no weld lines, meeting all aesthetic and functional requirements. With a \$40 cost savings per vehicle and a reduction of over 490,000 kg of CO₂ per year, this solution significantly improves sustainability. The tool design incorporates advanced gating and venting to manage the gases from PCR material, ensuring dimensional stability and surface quality while streamlining production.

CATEGORY: Hall of Fame Award - First Plastic Encapsulated Windows



The industry's first Plastic Encapsulated Windows – fixed rear quarter windows used on the 1978 General Motors Company A-Body Chevrolet, Pontiac, Oldsmobile and Buick Wagons; were named the 2024 Hall of Fame Winner. This innovation, now used on vehicles worldwide, was celebrated by honoring the technology and the companies and people affiliated with this application at the event. General Motors body engineers were looking for a way to “glaze” fixed windows that would improve acoustics and water penetration (better sealing), aesthetics (a cleaner less obtrusive appearance), and costs (labor and piece price). The solution was provided by tier molders Donnelly Mirror and Lamar Plastics who developed an injection molding process where a plastic molded “gasket” was directly applied to the window glass. These rather large fixed windows had a UV-stable, PVC gasket frame molded around the glass edges.

To be considered for a Hall of Fame (HOF) Award, an automotive plastic or composite component must have been in continuous service in some form for 15 years or more, made a significant and lasting contribution to the application of plastics in automotive vehicles, and broadly adopted and/or expanded upon in the automotive industry. Additional HOF award criteria includes that the nomination be: game changing; very successful worldwide; innovative in materials, process and application; and still being used. This application certainly qualifies as Encapsulated Windows are now an industry standard globally and the technology has expanded to use on windshields (PU RIM Molded), backlites (fixed or lift type back windshields), and sunroofs.

CATEGORY: Lifetime Achievement Award - Tom Russell



Tom Russell, a founder and retired partner at Allied Composites Technology LLC and former vice president of Product & Advanced Engineering at Lear Corporation, and previously at General Electric Plastics and Ford Motor Company, was named the 2024 Lifetime Achievement Award winner. Russell's leadership has led to multiple SPE IAG Grand and Hall-of-Fame Award winning applications. He has achieved numerous promotions throughout his illustrious career as he ascended to senior management positions and fostered game changing innovations in automotive plastics.

Russell pioneered important advancements in the automotive plastics industry including the development of the Ford Medium Duty Truck SMC Grille Opening / Reinforcement Panel, which won the Grand Award at the SPE Automotive Innovation Awards Gala (IAG) in 1979. At GE Plastics, he was a key member of the team that developed the materials for the five mph all-plastic front and rear bumper systems for the Ford Escort in 1984, which led to its implementation on the Ford Aerostar, Taurus/Sable, and Contour/Mystique vehicles. This innovation represented the largest global use of automotive thermoplastics and won the IAG Hall-of-Fame Award in 2004. Russell was also on the team that developed the MPPE/PA all thermoplastic fender on the 1988 Buick LeSabre sports coupe. This application won the 1988 SPE IAG Grand Award and the Hall-of-Fame Award in 2015.

Russell's formal education includes a Bachelor of Science degree in Mechanical Engineering from Penn State University, A Master of Science degree in Mechanical Engineering from California Institute of Technology (Caltech), and a Master of Business Administration (MBA) from the University of Michigan in Ann Arbor. Until his retirement, he was a licensed professional engineer in the State of Michigan.

SPE's Automotive Innovation Awards Program is the oldest and largest competition of its kind in the world. Dozens of teams made up of OEMs, tier suppliers, and polymer producers submit nominations describing their part, system, or complete vehicle and why it merits the claim as the Year's Most Innovative Use of Plastics. The annual event typically draws approximately 800 OEM engineers, automotive and plastics industry executives, and media. Funds raised from the event are used to support SPE educational programs including technical seminars and conferences, which help to educate and secure the role of plastics in the advancement of the automobile.

Sponsors of the 2024 SPE Automotive Innovation Awards include: Celanese, BASF Corporation, American Chemistry Council – Plastics Division, Sabic, INEOS Styrolution America and Vuteq Corporation.

The mission of SPE is to promote scientific and engineering knowledge relating to plastics worldwide and to educate industry, academia, and the public about these advances. SPE's Automotive Division is active in educating, promoting, recognizing, and communicating technical accomplishments in all phases of plastics and plastic-based composite developments in the global transportation industry. Topic areas include applications, materials, processing, equipment, tooling, design, and development. For more information about the SPE Automotive Div., see <https://speautomotive.com/>. For more information on the Society of Plastics Engineers, see www.4spe.org.

For more info on the SPE Automotive Innovation Awards, see <https://speautomotive.com/spe-automotive-div-innovation-awards-2023/>

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