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

TROY (DETROIT), MICH. – The Automotive Division of the Society of Plastics Engineers (SPE®) today announced the Finalists for its 53rd annual **Automotive Innovation Awards Program**, the oldest and largest recognition event (established in 1970) in the automotive and plastics industries. Nominations were first subjected to a pre-qualification review and then were presented before a panel of industry experts on October 3 – 4, 2024. That panel sent forward the most innovative nominations (category finalists) to the Blue Ribbon judging round, which was held October 11, 2024. Category and Grand Award Winners selected during the Blue Ribbon judging round will be announced on the evening of November 13, 2024, during the 53rd SPE Automotive Innovation Awards Gala at the Laurel Manor in Livonia, Michigan. Finalists from this year’s competition are listed below in category and submission order:

**CATEGORY: Aftermarket and Limited Edition/Specialty Vehicles
Hydraulic Tank**

Make & Model: 2024MY Compact Excavator

System Supplier:	Bemis Manufacturing Company
Material Processor:	Bemis Manufacturing Company
Material Supplier:	BASF
Resin:	Ultramid B3WG6 GPX BK23238 PA6 GF30
Tooling Supplier:	Bemis Manufacturing Company
Process:	Injection Molding

Believed to be the largest injection-molded polyamide automotive component, this hydraulic tank offers 5% mass savings, 20% cost savings, and 80% cycle time reduction over the previous roto-molded version. It is manufactured from optimized PA6 with a resin-rich surface that provides enhanced vibration weld capabilities and supports temperatures up to 200°F under fatigue and vacuum loads. With a capacity of 17 gallons, the dual-shell tank design integrates both upper and lower tank shells in one process-optimized tool for reduced part cost. Keys to its development included the application of scientific injection molding and CAE simulation.

**CATEGORY: Aftermarket and Limited Edition/Specialty Vehicles
Intake Manifold**

OEM Make & Model: 2023MY General Motors Co. Corvette Z06

System Supplier	Sogefi Group
Material Processor:	Sogefi Group
Material Supplier:	BASF
Resin:	Ultramid B3WG6 GPX PA6 GF30
Tooling Supplier:	Sogefi Group
Process:	Injection Molding

This high performance manifold represents GM's largest composite manifold assembly, replacing aluminum with 30% glass-filled PA6 for a 2.5 kg weight reduction. The design integrates 17 components into two molded and welded plenums, reducing part costs and improving assembly efficiency and dimensional stability. The composite material meets strict fatigue, burst, and thermal cycling requirements, handling engine speeds up to 8,600 rpm. With 110% volumetric efficiency, the manifold optimizes engine performance in the world’s highest-power naturally aspirated engine. The switch to PA6 also enabled more complex geometries, internal components, and enhanced surface appearance for branding and grain options.

CATEGORY: 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 (Extrusion grade)
Process:	Sheet Extrusion

As the first known thermoplastic-intensive battery pack to provide enhanced fire resistance in electric bus applications, the housing features 240 kg of plastic per vehicle and 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 soon after exposure.

CATEGORY: 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
Tooling Supplier:	Witol Automotive
Process:	Injection Molding

Use of this 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 design integrates a metallic sleeve inside a snap-fit clamshell PA6 housing, enabling real-time adjustments during assembly. This 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: Body Exterior

Front Emblem

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

System Supplier:	SL America
Material Processor	Wavelock Advanced Technology
Material Suppliers:	SABIC
	LG Chem
Resins:	Lexan LS1 PC
	Lupoy HR50007A PC+ABS
Tooling Supplier:	SL America
Process:	Film Extrusion, Thermofoming, Die Cutting, In-Mold Decorating an Injection Molded Substrate and Laser Welding

This emblem utilizes a two-pass laser welding process to join decorative inserts through a light-transmittable metallic galvano film, eliminating the need for chrome plating, hard coating, and heat staking. The first laser pass displaces metal particles from the PVD layer, while the second welds the insert to the lens. This approach removes two components, cutting CO₂ emissions by 45% compared to chrome plating. The recyclable, printed galvano film supports GM Studio's design intent and enhances sustainability. This method delivers cost savings while allowing for more complex styling without the environmental impact of traditional chrome-plated components.

CATEGORY: Body Exterior
A/C Pillar Appliqué / Hatch Molding

OEM Make & Model: 2024MY General Motors Co. Cadillac CELESTIQ

System Supplier:	Motherson Group
Material Processor:	Samvardhana Motherson Innovative Autosystems (SMIA) / Forecast 3D
Material Supplier:	Microtex
	BASF
Resin:	TC X1-120,140 carbon fiber
	Ultrasint TPU-01 TPU
Tooling Supplier:	Samvardhana Motherson Innovative Autosystems (SMIA)
Process:	Autoclave, Multi Jet Fusion (MJF) 3D Printing

By switching from traditional materials to carbon fiber and TPU, the Cadillac CELESTIQ's 8-foot-long A/C pillar appliqué and hatch molding combine multiple materials with varying CLTE for optimal performance. This industry-first application features a 3D-printed endcap to provide precise seal transitions. The composite is bonded to an aluminum rail, broken into five sections to minimize expansion. Additionally, this is the first known use of a hook-and-swing hatch closure, delivering both structural integrity and aesthetic refinement. The design reduces galvanic corrosion risk, enhances dimensional stability, and supports the luxury styling of this limited-production vehicle.

CATEGORY: Body Exterior
Illuminated Emblem

OEM Make & Model: 2024MY General Motors Co. Cadillac LYRIQ & Cadillac Escalade

System Supplier:	Hella Minth
Material Processor:	Hella Minth
Material Supplier:	SABIC
Resin:	ABS / PC / PMMA / PC+ABS
Tooling Supplier:	Jiaying Shinyon Mold Technology Co., Ltd.
Process:	Injection Molding

Unique and complex illuminated stair-stepping animations are made possible with a two-shot PC and PMMA structure, enabling a visually striking waterfall lighting effect from headlamps to emblem. This advanced emblem design, supported by a translucent layer and a light diffuser made from white PC, provides intricate perimeter illumination. The emblem's 65 mm deep "gem plate" and use of light guides outline its form, ensuring a precise light spread. The innovative use of laser welding protects internal components while supporting the GM Studio's design vision. This emblem will appear on five upcoming vehicle models.

CATEGORY: Body Exterior
Supporting Side Rails

OEM Make & Model: 2025MY Rivian Automotive, LLC Rivian R1T

System Supplier:	Gemini Group
Material Processor:	Gemini Group
Material Supplier:	Celanese
Resin:	Tecnoprene AK8 PPGF
Tooling Supplier:	Gemini Group
Process:	Extrusion

Use of glass fiber-filled PP in the tonneau cover rail delivers a 69% reduction in material costs and a 44% weight savings, removing 4.8 kg per vehicle versus the former aluminum version. This extruded plastic rail provides the necessary structural support for accessories while offering superior creep strength and hydrolysis resistance. Fully compatible with Rivian's general assembly practices, it also eliminates concerns about corrosion. Over the vehicle's 200,000-mile lifespan, the rail contributes to a 63 kg reduction in CO₂ emissions in designed vehicle lifetime mileage. The design ensures both dimensional accuracy and enhanced performance compared to traditional aluminum alternatives.

CATEGORY: Body Interior**Adjusting Locating System - Door Trim to IP**

OEM Make & Model: 2023MY General Motors Co. Cadillac LYRIQ

System Supplier:	Forvia
Material Processor:	Forvia
Material Supplier:	BASF
Resin:	Ultramid A3L HP UV3 PA66
Tooling Supplier:	HHX Tooling Industry Limited
Process:	Injection Molding

Assembly variability (a 4.5 mm build variation) was making thin, precise features between door trim and instrument panels an impossibility. This door trim location system reduces final position variation to +/- 1.5 mm up/down movement, utilizing a PA66 locating system to improve fit and finish relative to the instrument panel. It enables precise adjustments in 0.5 mm increments, reducing material costs by 30% and avoiding the need for new tools. Designed to support the LYRIQ's Flow Design philosophy, "Simplicity that Sings," it withstands the 6 kg door mass while minimizing warranty claims and enhancing perceived quality for mass production.

CATEGORY: 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 PA6 (GF10+M20)
Tooling Supplier:	Integrity Tool and Mold de México
Process:	Injection Molding

Believed to be a world-first design, 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: Body Interior**SYNC Move Display**

OEM Make & Model: 2024MY Ford Motor Co. Ford Explorer & Capri BEV

System Supplier:	Brose Group
Material Processor:	Omega Technology
Material Supplier:	BASF
Resin:	Ultradur B4300-G10 PBT/PET GF50
Tooling Supplier:	Omega Technology
Process:	Injection Molding

The SYNC Move's unique features, such as a manual pivot system, allow customers to adjust the screen's angle between 40 and 80 degrees, enhancing interior usefulness. In its highest position, the screen reveals a stowage compartment, "My Private Locker," which is locked and hidden when the screen is lowered. The system integrates ducting functionality into the injection-molded bracket, reducing the need for separate metal parts. Using highly filled PBT-PET material ensures durability while maintaining tight pivot tolerances of 0.2 mm. This innovation reduces part complexity, improves interior versatility, and would have been too difficult to create using metal.

CATEGORY: Chassis/Hardware**Jack Blocks**

OEM Make & Model: 2024MY Stellantis Dodge Daytona

System Supplier:	Arkal Automotive Systems
Material Processor	Arkal Automotive Systems
Material Supplier	BASF
Resin:	Ultramid B3WG13 HPX BK102 PA6 GF63
Tooling Supplier:	Arkal Automotive Systems
Process:	Injection Molding

Featuring an innovative energy management system, these jack blocks absorb impact energy while supporting the weight of the vehicle. They provide secondary EV battery protection during side impacts, complying with FMVSS214 regulations. Using 63% glass-filled PA6 achieves a 36% mass reduction compared to die-cast aluminum, saving 3.1 lbs. per vehicle. The blocks also break away upon impact, preventing intrusion into the battery in EVs. Robust construction withstands jack loads and harsh conditions, such as Mexican speed bumps (2X higher than US versions). This marks the first time Stellantis has implemented this technology in North America.

CATEGORY: Chassis/Hardware**Flame Retardant High Gloss EV Charger Cover**

OEM Make & Model: 2024MY General Motors Co Cadillac LYRIQ

System Supplier:	Aptiv PLC
Material Processor	Aptiv PLC
Material Supplier	SABIC
	Celanese
Resin:	Lexan EXL9330 PC
	Santoprene B100 TPV
Tooling Supplier:	Aptiv PLC
Process:	Injection Molding

With 40°C cold-weather ductility and UL94 V0 flame retardance, this EV charger cover uses a two-shot molded-in-color process with high-gloss, flame-retardant PC and TPV to replace paint. The modified PC copolymer maintains ductility and impact resistance at extreme cold temperatures, passing vehicle run over and drop tests. It also incorporates siloxane for improved low-temperature performance, ensuring the part remains intact even in harsh conditions. This design offers enhanced safety and durability, while the overmolded TPV provides a soft-touch, rubberized surface for durability and comfort. The use of polymer technology also reduces costs and environmental impact by eliminating painting and consolidating parts.

CATEGORY: 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: Chassis/Hardware**Traction Power Inverter Module Shield**

OEM Make & Model: 2025MY General Motors Co. GMC Hu

System Supplier:	US Farathane
Material Processor	US Farathane
Material Supplier	Ravago
	Ventek Solutions
Resin:	PA66
	Expanded PP
Process:	Injection Molding

This high-voltage protection system for the GMC Hummer’s TPIM combines impact-modified PA66 with expanded polypropylene bead foam to protect the module during underride crash events. The encapsulated design reduced point loads and prevented high-voltage shorting, while meeting critical launch timelines. The composite shield replaced the initial metallic solution, offering \$100,000 in tooling cost savings and reducing weight by 80g per part. The injection-molded PA66 shell, paired with the foam core, disperses energy, and ensures robust protection, and is believed to be the first use of this technology in the industry to address such an issue.

CATEGORY: Electric and Autonomous Vehicle Systems**Composite Battery Pack Cover**

OEM Make & Model: 2024MY General Motors Co. Chevrolet Corvette e-Ray

System Supplier:	deBotech Inc.
Material Processor	deBotech Inc.
Material Supplier:	SHD Composite Materials Inc.
Resin:	SHD FRVC411 Epoxy/woven fiberglass
Tooling Supplier:	DeBotech Inc.
Process:	Autoclave Molding

By reimagining the Corvette E-Ray’s battery pack cover, this compact design cuts weight by 80% compared to steel and 45% versus aluminum, all while fitting seamlessly into the existing ICE vehicle tunnel. Avoiding the need for new stamping tools, the cover uses a 30% glass-filled prepreg composite to ensure strength and stiffness, with precision CNC robotic drilling achieving tolerances under 0.1 mm. The one-shot compression molding process produces a surface that meets specs straight out of the tool, with no additional processing needed, and offers both mass savings and improved performance for this high-powered hybrid vehicle.

CATEGORY: Electric and Autonomous Vehicle Systems**Module Isolation Liner**

OEM Make & Model: 2025MY General Motors Co. Cadillac Lyriq & GMC Hummer

System Supplier:	Korea Electric Terminal
	Lear Corporation
Material Processor	Oakwood Group
Material Supplier:	RTP Company
	BeSpoke Planet
Resin:	RTP 2599 PC+ABS
	146980 A PC+ABS
Process:	Thermoforming

By cutting creepage distance in half, this isolation liner enables GM’s Ultium battery module to achieve a more compact, high energy-density design. Utilizing PC+ABS sheet, which is 20% thicker than PC, the liner boosts dielectric strength while offering enhanced resistance to tears, punctures, and thermal events, ensuring long-term durability in demanding environments, including up to 800 V fast charging. Thermoformed construction allows for precise dimensional integrity, even in critical areas, reducing the risk of failure. Additionally, the material’s flexibility supports multiple vehicle applications, all while simplifying manufacturing processes and improving overall safety performance across the battery’s lifespan.

CATEGORY: 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 H1030 PP Compound
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: Materials**Translucent TPO Bumper**

OEM Make & Model: 2024MY Geely Auto Geely Galaxy E5

System Supplier:	Geely Auto
Material Processor:	Wuhan Liaoyuan Mould Plastic Co., Ltd
Material Supplier:	Kingfa Sci. & Tech. Co., Ltd.
Resin:	KLUX-5019 HM TPO
Tooling Supplier:	Kunshan Hongyongsheng Mould Co., Ltd
Process:	Injection Molding

Combining lighting directly into the bumper, this translucent TPO material delivers a seamless, illuminated design that reduces the number of components by 50%, cutting costs in half. The lightweight, UV-resistant, and heat-resistant TPO meets crash and weather resistance standards while offering superior light transmission and durability. Laser etching allows for precise light diffusion, eliminating the need for hard coatings. With fewer tools and a simplified molding process, the bumper reduces its carbon footprint and is set to expand production from China to Mexico. This innovation enhances aesthetics and performance in a premium automotive application.

CATEGORY: Materials**High-Gloss 3D Diamond Grille**

OEM Make & Model: 2025MY Honda Motor Company Acura MDX

System Supplier:	SRG Global
Material Processor:	SRG Global
Material Supplier:	SABIC
Resin:	Lexan SLX2271T BK1E540
Tooling Supplier:	Glider Guard Tool & Die
Process:	Injection molding

Achieving high-gloss, molded-in-color precision, the 2025 Acura MDX grille meets stringent performance and weatherability targets, while reducing costs by 20% and eliminating the need for paint. By using a weatherable PC that forms a self-renewing UV absorption layer when exposed to light, the grille meets demanding performance and weatherability targets minus traditional paint. Sequential gating and optimized tooling reduce a large number of visible knit lines on the grille's intricate 3D shape. The design also reduces CO₂ emissions and streamlines production, delivering both aesthetic appeal and sustainability. Recycled grades of the material may present opportunities for further CO₂ reductions.

CATEGORY: 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: Materials
DRL/Turn/Park Optical Lightguide

OEM Make & Model: 2021MY General Motors Co. GMC Yukon

System Supplier:	North American Lighting
Material Processor	Global Plastics
Material Supplier	Roehm America LLC
Resin:	Acrymid TT50 PMMI
Tooling Supplier:	North American Lighting
Process:	Injection Molding

Used in GM's longest light guide to date, PMMI offers exceptional optical clarity and heat resistance, addressing the common issue of yellowing and degradation in traditional PC under high-intensity LED exposure. Unlike PC, which can deteriorate over time, PMMI remains stable, ensuring consistent light output and appearance throughout the life of the vehicle. Processed similarly to PMMA, the material requires no special tooling innovations, while offering a cost-effective solution that avoids the risk of recalls. With high thermal resistance up to 130°C and a self-renewing UV absorption layer, PMMI combines superior chemical resistance, dimensional stability, and durability in challenging applications.

CATEGORY: Materials
Connector Cover and Busbar Holder

OEM Make & Model: 2024MY Hyundai Motor Group Hyundai Staria

System Supplier:	Valeo Kapec
Material Processor:	Valeo Kapec
Material Supplier:	SABIC
Resin:	Sabic FR PP Compound
Process:	Injection Molding

As the first known use of unfilled FR PP material in an HEV battery module, this solution enables lighter weight, improved living hinge performance, and superior fire protection for two EV components. Replacing flame retardant PA6, the PP compound has lower density and offers better flow, flexibility, and elongation, allowing integration of parts and doubling production capacity through multi-cavity molding. The material resists flame exposure for five minutes at 1000°C, passing China's stringent EV flame evaluation. This innovation cuts weight by 10% or more, reduces costs by 20%, and eliminates halogens, delivering enhanced sustainability and improved range for electric vehicles.

CATEGORY: Powertrain
Throttle Position Sensor Rotor Isolator

OEM Make & Model: 2022MY General Motors Co Chevrolet Silverado

System Supplier:	Hitachi Astemo Americas
Material Processor:	Centech Plastics Inc.
Material Supplier:	Toray Industries
Resin:	Toraycon 1101GX65 B PBT GF40
Tooling Supplier:	Centech Plastics Inc.
Process:	Insert Injection Molding

This isolator, made from 40% glass fiber-reinforced PBT, enhances stiffness, strength, and dimensional stability, ensuring precise sensor readings. This isolator provides critical electrostatic discharge protection, shielding the throttle body position sensor from voltages up to 25kV. By blocking ESD from jumping between the shaft and sensor, the part prevents failures that could render the vehicle inoperative. The innovation has led to improved throttle body quality and increased customer satisfaction. This durable material holds the sensor rotor in place, ensuring reliability across powertrains and improving long-term vehicle performance.

CATEGORY: 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, 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: 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:	Ultramid 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: Process/Assembly/Enabling Technologies
Composite Body Panel Adhesive System

OEM Make & Model: 2024MY General Motors Co. GM BrightDrop

System Supplier:	Bostik
Material Processor:	Bostik
Material Supplier:	Bostik
Resin:	Bostik MSR CA Moisture Cure 1-Part SMP (Silane modified polymer)
Process:	Batch Mixing for SMP & Ambient Cure for Joint

The first known use of Silane Modified Polymer (SMP) for bonding composite body panels in vehicles, this system eliminates primers and oven curing, significantly reducing the CO₂ footprint of the manufacturing process. The isocyanate-free SMP improves operator health and cures at ambient temperature using moisture from the air, offering 11% mass savings and improved wet-out conditions compared to urethane. It enhances skiving capability, reducing water leaks and streamlining production. The lower pump pressure reduces equipment wear, minimizing maintenance. Originally developed for marine applications, SMP delivers robust bonding and sealing while eliminating routine health checks for operators, boosting safety and efficiency.

CATEGORY: Process/Assembly/Enabling Technologies
Door Speaker Grill

OEM Make & Model: 2024MY General Motors Co. Buick Enclave

System Supplier:	Forvia
Material Processor:	CS Manufacturing
Material Supplier:	Advanced Composites
Resin:	ADX5361 TPO
Tooling Supplier:	CS Manufacturing
Process:	Injection Molding

To tackle the challenge of molding long, delicate spans of plastic without deformation, this speaker grille design combined forward-thinking tooling techniques with a sleek, intricate pattern featuring 33 mm unsupported parallelogram-shaped openings. Using a metal 3D-printed conformal cooling insert and a secondary ejection plate with 136 ejector pins, the grille ejects without warping or sticking in the mold. This first known industry innovation ensures uniform cooling and precise ejection at each rib intersection. Molded in color using TPO, the design achieves dimensional stability while preserving the grille's unique aesthetic and intricate design.

CATEGORY: Process/Assembly/Enabling Technologies
Hard-on-Soft Two Shot Frunk

OEM Make & Model: 2021MY Toyota Motor Company Toyota Tacoma

System Supplier:	A&P Solutions
Material Processor:	A&P Solutions
Material Supplier:	Teknor Apex
	SABIC
Resin:	Sarlink TPV
	Sabic PP GF40
Tooling Supplier:	TIBO Plastics
Process:	Hard-on-Soft Two Shot Overmolding

A novel dual-resin solution for the Lucid Air created the largest frunk in the industry at the time, offering over 10 ft³ of usable space – four times larger than its closest competitor. By injecting a rigid polymer over a softer material, TIBO developed a flexible yet strong design that fits through a smaller opening during assembly and then expands to full size. This solution integrates mechanical and chemical bonding, ensuring durability for this high-weight component while optimizing production. The process eliminated the need for additional assembly steps, reducing complexity and improving efficiency on the production line.

CATEGORY: 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: Safety
Thermistor Insert

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

System Supplier:	Minth Group
Material Processor:	Minth Group
Material Supplier:	HP (Evonik)
Resin:	HP 3D High Reuseability PA12
Process:	Multi-Jet Fusion Additive Manufacturing

Additive manufacturing enabled the creation of a space-efficient thermal barrier that allows accurate temperature measurement in the EV battery system while improving safety. The 3D-printed spacer isolates the aluminum top plate from the thermal tape, reducing heat flow errors from 38% to 14%. This thin, 1.15 mm plastic insert achieves minimal warpage and precise dimensional control, features that would not be possible with injection molding, such as specific retention features that would cause die lock. By avoiding the need for tooling, the solution reduces costs and allows rapid design iteration, with 21 models produced and validated in just one week.

CATEGORY: Safety

Roof Mounted Passenger Airbag

OEM Make & Model: 2023MY Ford Motor Co. Ford Transit Custom

System Supplier:	ZF Lifetec
Material Processor	Wolfgang Loch GmbH & Co. KG
Material Supplier	ZF Lifetec
Resin:	350 dTex PA fabric (uncoated)
Tooling Supplier:	Wolfgang Loch GmbH & Co. KG

A first known application in large commercial vehicles, this roof-mounted airbag replaces traditional dashboard-embedded systems and frees up valuable cabin space. It allows the instrument panel to be repurposed for storage or larger navigation screens and additional dashboard features, while also reducing the risk of airbag-induced injuries. The airbag system features a high-strength steel housing and a polyamide cushion, which minimizes variation in deployment through 95% automated folding. Additionally, removing the need for a beauty cover saves \$12 per vehicle, contributing to sustainability goals by reducing components and material waste.

CATEGORY: Sustainability
Wheelhouse Outer Liner

OEM Make & Model: 2023MY General Motors Co. Chevrolet Silverado & GMC Sierra HD

System Supplier:	Autoneum
Material Processor:	Autoneum
Material Supplier:	Ultra-Poly Corporation
Resin:	PolyEncore UP2588 MC TPO (PCR)
Process:	Extrusion, Lamination, Thermoforming, Die Cutting

Produced for Chevrolet and GMC heavy-duty pickups, this liner represents the first known high-volume circular application using post-consumer automotive plastic from end-of-life fascia and bumper covers. By reclaiming materials from autobody repair facilities, the program has removed approximately 245,000 bumpers from landfills, achieving technical requirements and specifications without the need for new tooling or additives. The liner core consists of 100% recycled content, while the facing fabric also incorporates a high percentage of recycled material. This solution is cost-competitive with virgin TPO, and not only supports sustainability goals but also demonstrates the scalability of reclaiming end-of-life vehicle plastics.

CATEGORY: 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: Sustainability
PFAS-Free Engine Seal

OEM Make & Model: 2024MY GMC Acadia, Cadillac CT6, Cadillac XT5, Corvette Z06

System Supplier:	Uchiyama Group
Material Processor:	Uchiyama Group
Material Supplier:	Celanese
Resin:	Vamac AEM
Process:	Injection Molding

Found on multiple GM vehicles, this engine seal offers a sustainable solution by eliminating harmful chemicals and reducing the environmental impact. The ethylene acrylic elastomer (AEM) material provides the same high-pressure sealing performance as traditional fluorocarbon elastomers, withstanding oil at temperatures ranging from -40°C to 150°C. An increased seal height ensures a better contact pressure, preventing leaks and engine overheating. This innovation achieves 66% cost savings, 25% weight reduction, and a lower carbon footprint, while also reducing solid waste at the end of life. Targeted for all new GM vehicles, this seal offers greater sustainability and reliability in critical applications.

CATEGORY: Sustainability

Recycled Nylon Tufted Floor Mats & Carpet

OEM Make & Model: 2025MY Ford Motor Co. Ford Expedition & Lincoln Navigator

System Supplier:	Auria Solutions / Visscher-Caravelle
Material Processor:	Auria Solutions
Material Supplier:	Aquafil Group
Resin:	Econyl PA6 (PCR, PIR)
Process:	Fiber Extrusion, Tufting, Thermoforming

Chemically recycled nylon yarn used in premium tufted floor mats transforms waste into high-performance automotive carpet, diverting 72 million pounds of post-consumer carpets and fishing nets from landfills. Made through Aquafil's segregated process that depolymerizes nylon into caprolactam monomer, the chemically identical material matches the premium look and feel of virgin nylon, while generating up to 90% fewer CO₂ emissions during production. Color options range beyond the typical black, and the material is fully recyclable. The resulting carpet increases sustainable content from zero to 100%, with a minimal cost premium of 75 cents per vehicle.

Category Winners and a **Grand Award** winner, selected from these finalists during the Blue Ribbon judging by a group of journalists, academics, and retired industry chief engineers, will be announced on November 13, 2024 during the 53rd annual SPE Automotive Innovation Awards Gala at the Laurel Manor in Livonia, Michigan. A **Hall of Fame Award** will be presented for an innovative application that has been in use for 15 years or longer making a significant impact in the industry with increased applications. A **Lifetime Achievement Award** will also be presented to honor a person who has made significant contributions to the industry.

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

Since 1970, the **SPE Automotive Innovation Awards Competition** has highlighted the positive changes that polymeric materials have brought to automotive and ground-transportation industries, such as weight and cost reduction, parts consolidation, increased safety and enhanced aesthetics and design freedom.

During the competition phase of the event, dozens of teams made up of OEMs and suppliers work for months to hone submission forms and presentations describing their part, system, or complete vehicle module to support claims that it is the year's "**Most Innovative Use of Plastics.**" To win, teams must survive a pre-competition review and two rounds of presentations before industry and media judges.

This annual event usually draws over 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 educate and secure the role of plastics in the advancement of the automobile.

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, <https://speautomotive.com/spe-automotive-div-innovation-awards/>.

Attn: Editors: Photos of the Finalists, as well as a large collection of SPE Automotive Division digital photography, is available for download at: <https://www.flickr.com/photos/speautomotive/albums/with/72157673717033072>
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