



FOR IMMEDIATE RELEASE: 17 OCTOBER 2025
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SPE® AUTOMOTIVE NAMES FINALISTS FOR 54th ANNUAL AUTOMOTIVE INNOVATION AWARDS PROGRAM

TROY (DETROIT), MICH. – The Automotive Division of the Society of Plastics Engineers (SPE®) today announced the Finalists for its 54th 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 September 25 – 26, 2025. That panel sent forward the most innovative nominations (category finalists) to the Blue Ribbon judging round, which was held October 3, 2025. Category and Grand Award Winners selected during the Blue Ribbon judging round will be announced on the evening of November 5, 2025, during the 54th 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
 E Trunk Cargo Sliding Tray**

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

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|---------------------|--------------------------|
| System Supplier: | Thermoflex Corp. |
| Material Processor: | Thermoflex Corp. |
| Material Supplier: | Advanced Composites Inc. |
| Resin: | ADX-5301 TPO |
| Tooling Supplier: | Comet Tool Company |
| Process: | Injection Molding |

A first at GM, and first known industry-wide, the E Trunk slide-out cargo tray solves the reach problem in a 55-inch-deep front trunk. By bringing gear forward, the tray avoids extended reach and twisting that can strain users accessing the cargo area. Engineered to support 200 lb. at full extension, the tray also maintains a slim profile, preserving usable volume. An innovative attachment method between chrome-plated ABS and TPO eliminates four metal mechanical fasteners for a cleaner interface. Compared with a comparable metal assembly, the lightweight construction helps to cut mass while sustaining stiffness and scratch resistance.

**CATEGORY: Aftermarket and Limited Edition/Specialty Vehicles
 Ultrahigh Density Floor Mats**

Make & Model: 2025MY General Motors Co. Cadillac Celestiq

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|---------------------|---|
| System Supplier: | Ningbo Toupu Vibro-acoustics Technology Co., Ltd. |
| Material Processor: | Ningbo Toupu Vibro-acoustics Technology Co., Ltd. |
| Material Supplier: | Betap Tufting B.V. |
| Resin: | Tencel Lyocell Cellulose |
| Tooling Supplier: | Ningbo Toupu Vibro-acoustics Technology Co., Ltd. |
| Process: | Extruded yarn and tufting process |

Considered the first use of Tencel cellulose fiber in a luxury-vehicle floor mat, the ultrahigh-density design (143 oz/yd² vs. typical 16 oz/yd²) delivers a premium hand, resilient pile, and lasting surface appearance. Extruded eucalyptus-cellulose yarn is tufted, then piece-dyed in 11 colors to match bespoke interiors, with a metallic-clad luxury binding finishing the edge. Compared with conventional PA6 mats, the cellulose-based construction provides a measurable gain in perceived quality while supporting sustainability goals through a closed-loop process that recovers solvent to reduce waste. Craft-focused execution suits low-volume, hand-built applications without compromising durability.

CATEGORY: Aftermarket and Limited Edition/Specialty Vehicles
Energy Absorber

OEM Make & Model: 2025MY Aston Martin Valhalla

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|---------------------|---------------------------------------|
| System Supplier | Aston Martin Performance Technologies |
| Material Processor: | OPUS Formenbau GmbH |
| Material Supplier: | SABIC |
| Resin: | XENOY CL101 PC/PBT |
| Tooling Supplier: | OPUS Formenbau GmbH |
| Process: | Injection Molding |

This ‘hypercar’ features the first known integrated plastic side energy absorber for dihedral doors that delivers EV battery protection in side impacts. Placing the absorber in the door, not the sill, enables a slimmer sill for easier step-over. The injection-molded PC/PBT bonds to the door with adhesives and delivers higher specific energy absorption than a comparable metallic solution, validated from component through vehicle-level pole impact tests. Estimated savings include 25% mass vs. aluminum and ~65% direct cost, with a CO2 footprint comparable to aluminum. Lower mass eases door opening/closing, and the E-coat-capable material can be used in body-in-white on other platforms.

CATEGORY: Body Exterior
Inner & Outer Roof Assembly

OEM Make & Model: 2026MY General Motors Co. BrightDrop 400 & 600

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|---------------------|---|
| System Supplier: | Molded Fiber Glass (MFG) Companies |
| Material Processor: | Molded Fiber Glass (MFG) Companies |
| Material Supplier: | Molded Fiber Glass (MFG) Companies |
| Resin: | GMW15702 Polyester SMC |
| Tooling Supplier: | Century Tool, Century Automation, & Paragon D&E |
| Process: | Compression molding |

As GM’s largest production compression-molded roof assembly, this innovation removes paint and wrap steps. Deemed the industry’s largest SMC assembly, the color-matched white roofs feature class A surfaces with molded-in color. Two-piece SMC inners and outers replace 32 tooled parts: 18 bolts, all self-piercing rivets, and 8 seals. The UV-stable white outer meets SAE J2527 for UV exposure at 4500 kJ/m². Five additional colors are planned. A custom SMC chemistry with 8 million cP viscosity molds at a low ~400 psi, delivering mass-neutral performance versus aluminum and a quieter cabin. An integrated roof wiring harness frees cargo space and simplifies service.

CATEGORY: Body Exterior
Integrated Light Blade and Bezel

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

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|---------------------|--|
| System Supplier: | Valeo North America |
| Material Processor: | Valeo North America |
| Material Suppliers: | Covestro AG & Sumitomo Chemical |
| Resins: | Makrolon LED2245 PC Makrolon 2405 PC Sumipex MH 4332 PMMA |
| Tooling Supplier: | Valeo (China), Yusei Precision Machinery (China) Co., Ltd., & Startech Precision Engineering (China) Co., Ltd. |
| Process: | Injection molding (2K) |

Combining a light blade and metallized bezel into one sub-assembly, this lower tail lamp cuts parts from 32 to 1 and maintains a “dark when unlit” look. It is also the first known production use of a multifunction thick lens with complex coupling optics and first known pairing of dark metallization with a red theme via laser-cut texture. A two-shot PC build (clear plus partial black shot) manages tight tolerance and light-blocking to combine stop, turn, tail, and side-marker functions. Integration reduces cross-car internal lamp packaging by 25%. Savings include 25% tooling cost and 15% mass. Metallized surfaces are protected by clear PC lens.

CATEGORY: Body Exterior
Integrated Roof Rail Lighting

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

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|---------------------|----------------------------------|
| System Supplier: | JAC Products |
| Material Processor: | Rebo Lighting & Electronics, LLC |
| Material Supplier: | Asahi Kasei Corp. |
| Resin: | Thermylene PP |
| Tooling Supplier: | Mold Cam Tool & Engineering |
| Process: | Injection molding |

Integrated roof-rail lighting on the Ford Expedition places high-mounted lamps within a bracket and cover, blending into the rail profile when off and acting as rear-focused lights for camping and tailgating when on. The system ties into the vehicle’s 360-degree zone lighting and is controlled through the center screen. Thermal simulations guided material selection; a 45% glass-filled PP bracket and rear cover withstand up to 84 °C without a heat shield while maintaining gloss. Optimized packaging enables the lamp to ship and install as a separate end item. Serviceability stays simple: remove the rear cover, back out one screw, and unplug the harness.

CATEGORY: Body Exterior
Multi-Flex Midgate

OEM Make & Model: 2024MY General Motors Co. Chevrolet Silverado & GMC Sierra EV

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|---------------------|------------------------------------|
| System Supplier: | Flex-N-Gate LLC |
| Material Processor: | Molded Fiber Glass (MFG) Companies |
| Material Supplier: | CSP |
| Resin: | 834UV SMC |
| Tooling Supplier: | Flex-N-Gate LLC |
| Process: | Compression molding |

GM reimaged the midgate with its Multi-Flex/Multi-Pro version, including a flipper door that accommodates the vehicle’s 60/40 split door. This enables access to the cab for through-bed cargo while keeping a rear-seat passenger or child seat in place. A weatherable 834UV SMC compression-molded gate replaces a steel structure with no loss in structural performance. Stowable bed space spans nearly 11 ft. with the endgate load step up. A one-button smart latching structure makes it easy to switch between multiple configurations. Back glass can be stowed in the flipper door. During development, 3D printed parts and bucks validated sealing; production parts boast leak-free performance.

CATEGORY: Body Interior

Automatic Adjustable Lock Knob Bezel

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

| | |
|---------------------|------------------------|
| System Supplier: | ISGO North America LLC |
| Material Processor: | ISGO México (San Luis) |
| Material Supplier: | Teknor Apex Company |
| Resin: | Sarlink 6775N TPV |
| Tooling Supplier: | ISGO North America LLC |
| Process: | Injection Molding |

This team developed an automatic adjustable lock-knob bezel that ends buzz, squeak, and rattle while restoring smooth knob travel. A TPV (Shore A 75) replaced a slightly harder TPO, while a “football-shape” created a local interference feature that also prevents wear and blocking. The innovative design improves function across multiple platforms as it is now standardized as a Common Corporate Component, requiring one part number for all doors and upper-panel trim constructions. It requires no poka-yoke; an independent attachment strategy speeds installation. Tooling scales with three 8-cavity molds. At half the size of the former TPO version, the PTV bezel trims mass by 50%.

CATEGORY: Body Interior

Power Sliding Console

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

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|---------------------|--|
| System Supplier: | Summit Polymers, Inc. |
| Material Processor: | Summit Polymers, Inc. |
| Material Supplier: | Washington Penn & Celanese |
| Resin: | Pro-Touch 8665 PP/EPDM Celcon M90 POM |
| Tooling Supplier: | Commercial Tool & Die, Inc. |
| Process: | Injection Molding |

Redesigned power sliding console mechanism and structure delivers best-in-class 32.4 L storage (open or closed). Executed in 35% glass- and talc-filled PP, it replaces cast magnesium with a POM bracket and PP upper retainer with integrated third rail that trims mass by 2 kg (≈20% vs. direct competitors), cuts part count in half, and saves about \$20 per vehicle while maintaining rigidity. The console travels 200 mm, adds a locking feature to protect valuables, and places an intuitive power switch ahead of the armrest. Hidden storage sits beneath the cupholders/media tray, with 47% recycled resin used in the upper retainer/rail.

CATEGORY: Body Interior

Backlit Wooden Decorative Trim

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

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|---------------------|---------------------------------------|
| System Supplier: | Shanghai Gennault Electronic Co. Ltd. |
| Material Processor: | Novem Group S.A. & NBHX Trim Group |
| Material Supplier: | LG Chem |
| Resin: | IH830A Optical PMMA |
| Tooling Supplier: | |
| Process: | Injection Molding |

Trim component reinvents ambient lighting with a UV and thermal resistant PMMA light-guide whose engineered optical-deflector points scatter light precisely across the surface. The result is vivid color, smooth diffusion, and uniform intensity from a single light source, yielding about 34% cost savings versus typical polycarbonate executions that require two sources. A multilayer deco assembly consisting of PUR, real wood veneer, and polycarbonate over the PMMA guide keeps optics behind the surface while preserving the natural grain under clear coat. Fewer components simplify packaging and service. The

approach also supports sustainability goals by cutting energy and material use without sacrificing design freedom.

CATEGORY: Body Interior
Integrated Light Pipe Carrier and Lens

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

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|---------------------|--|
| System Supplier: | Methode Electronics Automotive Solutions Group |
| Material Processor: | CY Molds Limited |
| Material Supplier: | Covestro AG |
| Resin: | Makrolon 2407-021532 PC |
| Tooling Supplier: | CY Molds Limited |
| Process: | Injection Molding |

An ambient-light pipe carrier and diffuse lens are molded into one polycarbonate part attached to the IP substrate. The result is a continuous, segment-free appearance across a long run using only three LEDs, vs. the 40 to 50 LEDs typical of acrylic light-pipe applications, while maintaining uniform intensity without hot spots. Optical geometry in the PC guide manages coupling, mixing, and cutoff in tight packaging, and the resin’s clarity and UV stability suit the high-load IP zone. Consolidation trims parts and assembly steps, contributing to ~33% cost savings versus the prior multi-piece stack. Fewer interfaces also improve perceived quality by eliminating visible part-line breaks.

CATEGORY: Chassis/Hardware
Coolant Temperature Sensor

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

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|--------------------|---------------------------------|
| System Supplier: | Cooper Standard Automotive Inc. |
| Material Processor | Cooper Standard Automotive Inc. |
| Material Supplier | Celanese |
| Resin: | Zytel 70G30 HSLR Black PA66 |
| Tooling Supplier: | Cooper Standard Automotive Inc. |
| Process: | Injection Molding |

Integrating a coolant temperature sensor into the plastic quick connector streamlines the Lyriq’s thermal plumbing and reduces leak risks at the module level for increased reliability. This single-connector design removes two connection operations at the supplier, cuts piece cost by 33%, and uses a single tube-forming step instead of two. Weight drops by 12% versus the separate inline-sensor approach, while tooling investment falls by about 15%. Packaging stays compact without compromising sensing accuracy, and assembly complexity is reduced because there are fewer joints to manage and seal. The scalable connector design is injection molded in PA66 and validated for EV/ICE cooling-service requirements.

CATEGORY: Chassis/Hardware
Integrated Seal Bumper Retainer

OEM Make & Model: 2024MY Toyota Motor Corp. Toyota Crown Signia

| | |
|--------------------|---------------------|
| System Supplier: | Nifco America Corp. |
| Material Processor | Nifco America Corp. |
| Material Supplier | Celanese |
| Resin: | Celcon M90 POM |
| Tooling Supplier: | Nifco America Corp. |
| Process: | Injection Molding |

A patent-pending integrated seal bumper retainer replaces the add-on foam gasket with a molded “umbrella” around the grommets, delivering water sealing without foam or manual assembly. POM brings a balance of flexibility and stiffness, enabling compression and rebound while enhancing Nifco’s quarter-turn push-pin system that streamlines repairs. A dual-slide tool minimizes umbrella size and keeps the sealing surface free of parting lines, forming the required four contact points to maintain compression against the body. Translatable to other vehicles, program economics include ~15% cost savings, and the all-POM construction supports Toyota’s circular factory recycling goals.

CATEGORY: Chassis/Hardware**Transmission & Transfer Case Vent Cap**

OEM Make & Model: 2025MY General Motors Co. Chevrolet Silverado HD & GMC Sierra HD

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|--------------------|----------------------|
| System Supplier: | AKWEL S.A. |
| Material Processor | AKWEL S.A. |
| Material Supplier | Syensqo |
| Resin: | Amodel A-4145 HH PPA |
| Tooling Supplier: | AKWEL S.A. |
| Process: | Injection Molding |

Heavy-duty diesel trucks make the switch from steel to a one-piece polyphthalamide vent cap, believed to be an industry first. The PPA cap replaces a three-piece steel design while meeting identical function, assembly procedure, and package dimensions for drop-in interchangeability and service compatibility. The 45% glass-fiber reinforced, heat-stabilized grade carries a continuous-use temperature of 230°C, exceeding desert test heat requirements with a safety factor greater than 1. Additional validation testing covered flow rate and restriction, heat-age and cold-impact, water-inclusion resistance, and transmission-fluid chemical compatibility. The result is a 62% direct cost reduction with fewer subcomponents, no corrosion risk, and shorter manufacturing time.

CATEGORY: Electric and Autonomous Vehicle Systems**High Voltage Battery Pack Multifunction Vent**

OEM Make & Model: 2025MY General Motors Co. Corvette ZR1X & E-Ray

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|--------------------|--------------------------|
| System Supplier: | Nitto, Inc. |
| Material Processor | Nitto, Inc. |
| Material Supplier | Nitto, Inc. |
| Resin: | Temish NTF9000 ePTFE |
| Tooling Supplier | Nitto, Inc. |
| Process: | Extrusion / expansion |

Pressure control and battery pack protection drove a new vent design: a compact, adhesive-mounted unit that equalizes pressure during normal operation and provides emergency relief in a thermal runaway event while blocking water and contaminants. The construction uses ePTFE (expanded PTFE) membrane laminated to a bromine-free PET mesh backing for a waterproof, breathable seal with chemical resistance and electrical insulation. Double-coated acrylic adhesive tape completes the construction. Replacing traditional screw-in or snap-fit vent modules eliminates housings and fasteners, delivering about 70% direct cost reduction and 90% mass reduction. Additional benefits include reduced condensation, lower electrolyte loss, and proven reliability.

CATEGORY: Electric and Autonomous Vehicle Systems**Interconnect Board Assembly**

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

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|--------------------|-------------------------------------|
| System Supplier: | Sun Microstamping Technologies, LLC |
| Material Processor | Sun Microstamping Technologies, LLC |
| Material Supplier: | LG Chem |
| Resin: | Lumid GN22512BF PA66 |
| Tooling Supplier: | Sun Microstamping Technologies, LLC |
| Process: | Injection molding |

To meet a low roofline and premium styling targets, engineers packaged the battery with horizontally stacked pouch cells and injection-molded interconnect board frames. The design cuts interconnect-module height by 43% versus a standard GM module and achieves the lowest profile cited across the industry. A 25% glass-filled PA66 frame provides CTI over 600 V and dielectric strength of 22 kV/mm, allowing busbars to be spaced closer while meeting creepage requirements. Flammability is V0 at 0.8

mm, and molded slots enable directional cell venting to limit thermal propagation. Heat staking, latches, thread-forming bosses, and adhesive joints keep the assembly within the tight module envelope.

CATEGORY: Electric and Autonomous Vehicle Systems

RESS Cell Tab Cooling Module

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

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|--------------------|--------------------------------|
| System Supplier: | Sun Microstamping Technologies |
| Material Processor | Sun Microstamping Technologies |
| Material Supplier: | SABIC |
| Resin: | KONDUIT PX11311U PA6 |
| Tooling Supplier | Sun Microstamping Technologies |
| Process: | Injection molding |

To cool a tight battery module, engineers overmolded conductive PA6 material - a first for an RESS application - onto nickel-plated copper heat sinks in its module covers. Heat flows from the cell tabs into compressible thermal pads, through the conductive plastic cover to the embedded sinks, and out to the module enclosure, preserving electrical isolation. The 15% glass-, 20% mineral-filled material provides design freedom vs. metal. Its 600 V CTI, UL94 V-0 rating, and dielectric strength enable robust sealing. The result meets zero to 60 performance targets and supports the vehicle’s low-profile styling. Module covers also function as structural supports.

CATEGORY: Electric and Autonomous Vehicle Systems

Battery Pack Weld Splatter Shield

OEM Make & Model: 2025MY General Motors Co. Corvette ZR1X & E-Ray

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|---------------------|--------------------------------------|
| System Supplier: | Creative Foam Corporation |
| Material Processor: | Creative Foam Corporation |
| Material Supplier: | Klöckner Pentaplast of America, Inc. |
| Resin: | Pentaform TH-M280/14 PVC |
| Tooling Supplier: | Creative Foam Corporation |
| Process: | Thermoforming |

Patented, industry-first integrated shield prevents molten weld spatter from damaging critical battery pack components, reducing isolation faults and scrap. Laser tab welding poses a high-stakes risk: molten spatter can reach the cell stack, damage isolation films, and create electrical faults. The solution is this thin-gauge PVC shield that nests beneath the ICB, blocks debris by melting around particles without pass-through, and drops into the existing module envelope. The 0.3 mm, inherently V-0 film also guides cell tabs during installation, improving decking quality and speed while reducing rework and scrap. Commodity packaging-grade PVC keeps cost low, and specialized knife-cut tooling delivers intricate geometry.

CATEGORY: Materials

HVAC Outlets

OEM Make & Model: 2023MY General Motors Co. Chevrolet Silverado EV

| | |
|---------------------|--------------------------|
| System Supplier: | Summit Polymers, Inc. |
| Material Processor: | Summit Polymers, Inc. |
| Material Supplier: | TOYOBO MC U.S.A., Inc. |
| Resin: | Vylopet EMC-705NZ PBT/PC |
| Tooling Supplier: | Summit Polymers, Inc. |
| Process: | Injection Molding (2K) |

High-gloss HVAC outlets achieve a class-A finish without paint or chrome by pairing a structural PBT base with a two-shot PBT/PC cosmetic layer. Optimized PBT/PC flow fills complex vane geometry with minimal knit lines, enabling bright MIC colors such as deep black and metallic silver while maintaining dimensional control. Chemical-resistance testing against common interior cleaners shows no cracking or whitening, so the surface keeps its gloss in use. Replacing painted or chrome-plated trim reduces

environmental burden and cuts cost by 50 to 75% compared with those finishing steps. The approach delivers a durable appearance part that meets outlet deflection criteria and simplifies the build.

CATEGORY: Materials

Fluoropolymer for Engine Seals

OEM Make & Model: 2025MY General Motors Co. Chevrolet Silverado & GMC Sierra

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|---------------------|--------------------------------------|
| System Supplier: | Freudenberg-NOK Sealing Technologies |
| Material Processor: | Freudenberg-NOK Sealing Technologies |
| Material Supplier: | Syensqo |
| Resin: | Tecnoflon FKM Fluoroelastomer |
| Tooling Supplier: | Freudenberg-NOK Sealing Technologies |
| Process: | Injection molding |

A patented polymerization route for FKM (vinylidene fluoride-based fluoroelastomer) enables PCV valve, PCV hose, and oil-gallery plug O-rings to meet rigorous constraints while eliminating the PFAS surfactants traditionally used in emulsion polymerization. Believed to be an industry first, the material holds performance at 175°C and -40°C, resists hot oil and blow-by gases, and achieves tear strength ≥18 kN/m to meet ASTM D624. Sealing stability includes compression set at 175°C for 72 hours at 15% compression and ≥30% retained force in compression stress relaxation. The material guards against O-ring degradation that could result in stalling, increased emissions, and engine fire.

CATEGORY: Materials

High Gloss Black Grille

OEM Make & Model: 2024MY General Motors Co. GMC Acadia

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|---------------------|--------------------------|
| System Supplier: | SINJIN Plastics Co., Ltd |
| Material Processor: | SINJIN Plastics Co., Ltd |
| Material Suppliers: | SABIC |
| Resin: | ELCRES SLX2291T PC |
| Tooling Supplier: | SINJIN Plastics Co., Ltd |
| Process: | Injection molding |

Molded-in-color, high-gloss PC grille replaces painted ABS to deliver a class-A finish with lower cost and fewer constraints on styling. Using a high-flow, weatherable PC copolymer fills complex mesh features with minimal knit lines, supports contrasting low-gloss textures with fewer blemishes, and releases cleanly from the tool. This is the first GM application of the grade, which maintains impact strength after extended weathering. Design freedom is enabled with deeper draws and reduced draft, cut from about 7% to 2%, while radar transparency preserves sensing performance. Eliminating paint steps drives roughly 15 to 20% cost savings; reduced drop requirements lower tooling cost.

CATEGORY: Powertrain

Dry Sump Tank

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

| | |
|--------------------|------------------------------|
| System Supplier: | EtringKlinger AG |
| Material Processor | EtringKlinger AG |
| Material Supplier | Ascend Performance Materials |
| Resin: | Vydyne R530HT BK02 PA66 |
| Tooling Supplier: | EtringKlinger AG |
| Process: | Injection Molding |

Engine-mounted tank solves packaging and performance targets by replacing a multi-piece aluminum reservoir with a formed plastic design that maximizes interior volume around the V8 engine. The tank holds 8 qt. of deaerated oil, withstands thermal cycling from -40°C to 150°C and peak oil at 130°C, and is validated for the vibration loads of a flat-plane crank. First execution of a dry sump tank directly mounted to the engine on a flat-plane V8, it removes hose runs to cut parts and leak paths. Injection-molded PA66 halves receive full-perimeter hot-gas weld. Design freedom is paired with reductions in mass (~50%) and cost (72%) vs metal.

**CATEGORY: Powertrain
Thin Wall ETC Actuator Gears**

OEM Make & Model: 2025MY General Motors Co. Chevrolet Equinox & GMC Terrain

| | |
|---------------------|----------------------------|
| System Supplier: | Schaeffler AG |
| Material Processor: | Schaeffler AG |
| Material Supplier: | Envalior |
| Resin: | Stanyl PA46 |
| Tooling Supplier: | IWIS Mobility Systems GmbH |
| Process: | Injection Molding |

First known ultra-thin wall gear design for electronic throttle control delivers accurate pedal-to-throttle response with a mid-gear design that absorbs impact to eliminate tooth breakage. High-flow PA46 blended with PTFE and 50 to 60% glass fiber achieves maximum stiffness and minimum wear. Gears achieve precise geometry via post-mold heat treating for 30% higher stiffness and 20% increased wear resistance. Novel gate strategy enables ultra-thin sections, required fiber orientation, tight gear tooth tolerances and balanced fill to minimize warpage with controlled shrinkage. Ultra-thin wall gear design enables the electronic throttle control to have 30% weight reduction, 20% cost reduction and 20% space reduction vs. a 1.5mm thick standard wall gear design in an electronic throttle control.

**CATEGORY: Powertrain
Transmission Oil Pan**

OEM Make & Model: 2025MY Ford Motor Co. Ford F250 Super Duty

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|---------------------|-------------------------|
| System Supplier: | Montaplast GmbH |
| Material Processor: | Montaplast GmbH |
| Material Supplier: | BASF |
| Resin: | Ultradid A3ZG7 OSI PA66 |
| Tooling Supplier: | Maximum Mold |
| Process: | Injection Molding |

Packaging and service needs drove a fresh design for this road-exposed oil pan, which sets fluid level without a dipstick and traps debris at the source. Its integral standpipe and level-indicator plug establish the factory fill and drain any excess automatically, while a built-in magnet collects ferrous particles before they reach sensitive components. A pan-specific press-in-place seal remains in full fluid contact, and a duckbill feature on the pan allows center expansion and contraction without compromising flange sealing. Stone impacts are managed by a waffle pattern and side ribs. The team used CAE warp predictive analysis extensively to prevent warp and ensure sealing integrity.

**CATEGORY: Process/Assembly/Enabling Technologies
Lit Applique**

OEM Make & Model: 2025MY Ford Motor Co. Ford Explorer

| | |
|---------------------|-----------------------------|
| System Supplier: | OPmobility SE |
| Material Processor: | Advanced Decorative Systems |
| Material Supplier: | Covestro AG |
| Resin: | Makrofol UV503 PC film |
| Tooling Supplier: | |
| Process: | Injection Molding |

This backlit film insert delivers three light intensities in a space so tight a conventional lens would not fit, yet also meets legal exterior-lighting requirements. Among the first known high-volume applications of in-mold film for rear lamps, the design integrates a diffusion layer and multilayer graphics into the PC film to achieve a homogeneous, segment-free appearance without hot spots. Produced in a 4-step process (print, form, cut, insert mold), the part resists chemicals and UV, fits seamlessly into the liftgate and body-side areas, and reduces cost and weight by removing bulky lens components. Result: a clean signature at lower cost and reduced weight.

CATEGORY: Process/Assembly/Enabling Technologies

Tail Lamp Piano Key Lens

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

| | |
|---------------------|----------------------------|
| System Supplier: | Forvia SE |
| Material Processor: | Forvia SE |
| Material Supplier: | Covestro AG |
| Resin: | Makrolon AL 2647-357868 PC |
| Tooling Supplier: | Forvia SE |
| Process: | Injection molding (3K) |

In a first-known application use in North America, the team used three-shot rotary molding with reverse ejection to create a signature lens with 17% more optical efficiency. Staying on the moving side for all shots, the lens is transferred to the stationary side for ejection. Six potential injection sequences for the multicolor / multigrade PC shots (red, clear, black) are optimized to prevent color bleeding. Sculptural sections (4 to 10 mm) are filled from thin to thick, while revised draft angles protect optical quality. Tooling manages >250 shutoffs, versus the typical 10 to 20. Part savings: 20% weight, 50% assembly.

CATEGORY: Process/Assembly/Enabling Technologies

Lit Badge

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

| | |
|---------------------|-------------------------|
| System Supplier: | Eypex Corporation |
| Material Processor: | Nishoku Technology Inc. |
| Material Supplier: | SABIC |
| Resin: | KONDUIT DTK22 PC |
| Tooling Supplier: | Eypex Corporation |
| Process: | Injection molding (2K) |

Heat management, electrical isolation, and tight packaging come together in a two-shot backlit badge that eliminates metal heat sinks while optimizing cost and processing. This approach removes typical assembled PCB design limitations, and injection molding lowers tooling and processing cost vs. die casting while supporting durable snap-fit assembly without extra hardware. The electrically isolative backplate is molded from a thermally conductive PC with UL94HB at $\geq 0.5\text{mm}$ and non-halogenated FR additive. The laser-transparent PC surround enables perimeter laser welding to the lens with a laser-absorbing film. Using all-PC materials aligns CLTE with the lens for dimensional stability and allows for molded in connectors.

CATEGORY: Process/Assembly/Enabling Technologies

Door Panel with Texture Matched Parting Line

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

| | |
|---------------------|----------------------------|
| System Supplier: | Forvia Interiors |
| Material Processor: | Forvia Interiors |
| Material Supplier: | Advanced Composites Inc |
| Resin: | ADX5361 TPO |
| Tooling Supplier: | Integrity Tool & Mold Inc. |
| Process: | Injection Molding |

Map-pocket appearance and strength required zero parting line, seamless grain, and tight deformation limits with a 3.5 mm section on a 2.3 mm nominal part. The solution: a first-known, texture-matched parting line (TMPL) insert with a front-loaded, four-piece cashew gate. During tool matching, the cashew insert is removed so the TMPL can be hand-matched and grained, then reinstalled. In production, the cashew can be pulled for maintenance without disturbing the matched insert. A special tooth-locker prevents rotation, and an elongated cashew geometry bypasses

the A-surface. Results include clean optics with no gate defects, intended knit-line placement, and application across all four doors.

CATEGORY: Safety
Carbon Fiber Hood

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

| | |
|---------------------|----------------------|
| System Supplier: | CPC Group S.r.L. |
| Material Processor: | CPC Group S.r.L. |
| Material Supplier: | Syensqo |
| Resin: | MTM57 Resin Epoxy |
| Tooling Supplier: | CPC Group S.r.L. |
| Process: | Autoclave processing |

Believed to be the largest carbon-fiber clamshell hood paired with active safety technology, this scalable innovation paired with a patented metallic bracket, meets VRU head-impact targets. The autoclave-cured prepreg epoxy carbon fiber inner and outer are engineered with a ply construction and geometry optimized for safety. On impact, the hood rises within 16 milliseconds and absorbs energy while maintaining crash and durability performance. Size is the story: 3.5 m² area and 79" width, larger than aluminum and composite competitors. CAE results show 83% correlation to physical tests. Program-level comparisons across CF structures indicate 26% mass and 85% tooling investment savings versus aluminum.

CATEGORY: Safety
Integrated Dual Brightness Enhancement Film

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

| | |
|--------------------|--|
| System Supplier: | AUO Corporation |
| Material Processor | 3M Company |
| Material Supplier | 3M Company |
| Resin: | PET PC |
| Tooling Supplier: | 3M Company |
| Process: | Film microreplication, lamination & converting |

Designing a car-forward, pillar-to-pillar display created safety concerns due to windshield reflection. ALCF A5+ film from 3M integrates its Light Control and Dual Brightness Enhancement Films, other layers, and LCD panels to remove that reflection. In this first/largest application of the hybrid film, a 48-inch display is viewable over the steering wheel with a narrowed viewing angle. A PC louver layer tilts toward the driver eye box by about 3–5 degrees while another layer maintains display efficiency. Consolidation trims parts and assembly for about \$10/part cost savings. 3M uses roll-to-roll microreplication along with other processes to create the hybrid film.

CATEGORY: Sustainability
Frunk & Rear Compartment

OEM Make & Model: 2025MY General Motors Co. Cadillac Escalade IQ, Cadillac Optiq EV, & Chevrolet Equinox EV

| | |
|---------------------|--|
| System Supplier: | SA Automotive & ABC Technologies, Inc |
| Material Processor: | SA Automotive & ABC Technologies, Inc |
| Material Supplier: | Ravago Manufacturing |
| Resin: | MAFILL CR CT 6344H PP/PE |
| Tooling Supplier: | Ming Mold Industrial Co., Ltd, Integrity Tool & Mold, Inc. |
| Process: | Injection molding |

Frunk and rear-cargo components switch from prime resin to an 80% post-industrial recycled PP compound across Escalade IQ, Optiq, and Equinox EVs, replacing 7.12 million pounds to date. Divider, load floor, flipper panel, frunk panels, and sill plate keep required strength, with the recycled material showing higher tensile performance than the virgin counterpart. Component thickness drops from 3.0 to 2.5 mm while meeting load cases after physical and CAE validation. Direct resin cost falls by 22.83% per pound, with added benefits in plastic-waste, GHG, and energy reductions. This is the first known execution in recycled materials for interior frunk and rear-compartment parts.

CATEGORY: Sustainability

Carbon Neutral Carbon Black

OEM Make & Model: 2025MY General Motors Co. Chevrolet Silverado, GMC Sierra, Chevrolet Corvette

| | |
|--------------------|---|
| System Supplier: | Lawrence Plastics |
| Material Processor | Lawrence Plastics |
| Material Suppliers | Monolith Corporation, Washington Penn, Modern Dispersions |
| Resin: | PPC5GF3 MC PP |
| Tooling Supplier: | Lawrence Plastics |
| Process: | Injection molding |

Lower-carbon carbon black produced via methane pyrolysis appears in a 30% glass-filled PP bracket, marking its first known commercial use in an automotive plastic component. The Monolith process delivers 95% conversion versus 50 to 60% for furnace black and cuts CO₂ emissions by over 70% while using ~40% less water and fossil fuel. At 2% loading in the compounded resin, integration was seamless with no processing or property differences and minimal cost impact. Estimated savings are 132,000 kg CO₂ per year and more than 148,000 bottles of drinking water, while reducing SOx emissions by 90% - all without color-matching compromises.

CATEGORY: Sustainability

Hydrocarbon Modified Wood/PP Composites

OEM Make & Model: 2025MY Hyundai Motor Company Kia EV5

| | |
|---------------------|-----------------------|
| System Supplier: | KAIS, LLC |
| Material Processor: | KAIS, LLC |
| Material Supplier: | MIKA Inc. |
| Resin: | MIKAIN MK-PCT5EF20 PP |
| Tooling Supplier: | KAIS, LLC |
| Process: | Injection molding |

Creating a hydrocarbon-modified wood flour masterbatch (70%) is the innovation that allowed this team to achieve large parts at final loadings of 20–30% wood while maintaining flow and dimensional control. The solids-phase surface treatment they developed using hentriacontane - found in bees and plants - weakens hydrogen bonding in cellulose, improving dispersibility and allowing processing at 180 - 190°C to minimize odor. Pairing recycled ELV PP with wood lifts eco-materials content above 50 wt% and supports door center trim substrates that will be covered with fabric or leather. Parts achieve 30% cost savings compared to a 10% bio-PE / PP blend.

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 5, 2025 during the 54th 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.

Sponsors of the 2025 SPE Automotive Innovation Awards Gala to date include: Celanese, BASF Corporation, American Chemistry Council – Plastics Division, Sabic, Covestro, Omya Specialty Materials, ElringKlinger Automotive Manufacturing, 3M Advanced Materials, and Nifco.

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 600 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/>.

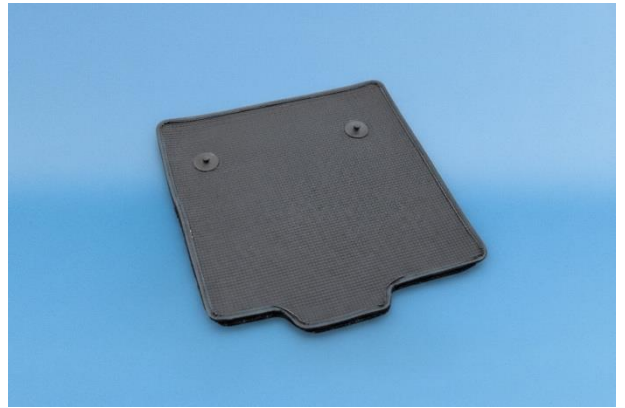
Attn: Editors: Photos of the Finalists, as well as a large collection of SPE Automotive Division digital photography, is available for download at: <https://www.flickr.com/photos/speautomotive/albums/with/72157673717033072>
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2025 IAG Finalists

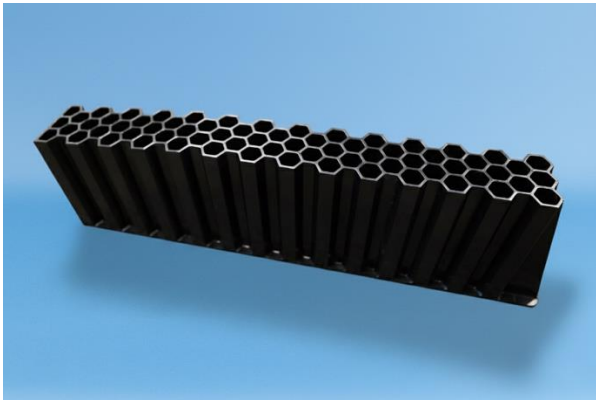
High-resolution photos can be downloaded via Flickr: <https://flic.kr/s/aHBqjCwAL>



**Aftermarket and Limited Edition/Specialty Vehicles
E Trunk Cargo Sliding Tray**



**Aftermarket and Limited Edition/Specialty Vehicles
Ultrahigh Density Floor Mats**



**Aftermarket and Limited Edition/Specialty Vehicles
Energy Absorber**



**Body Exterior
Inner & Outer Roof Assembly**



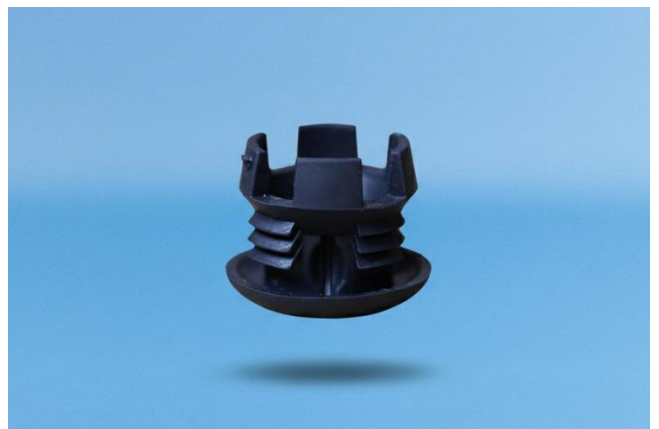
**Body Exterior
Integrated Light Blade & Bezel**



**Body Exterior
Integrated Roof Rail Lighting**



**Body Exterior
Multi Flex Midgate**



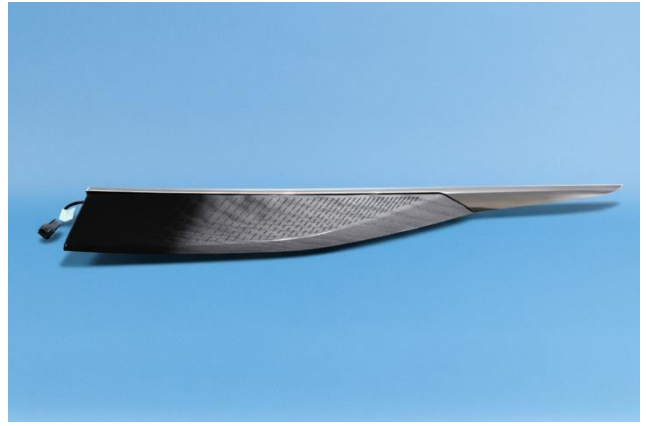
**Body Interior
Automatic Adjustable Lock Knob Bezel**

2025 IAG Finalists

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Body Interior
Power Sliding Console



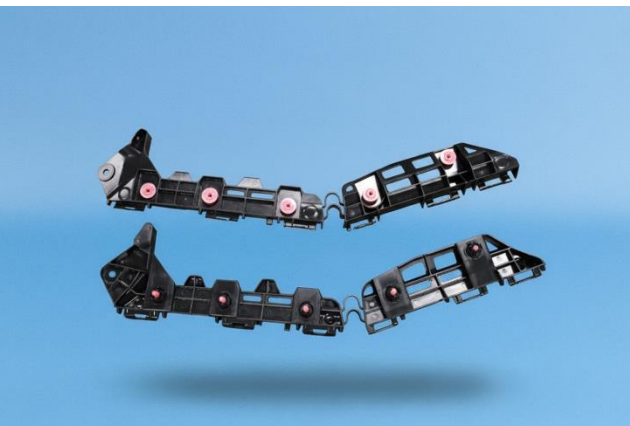
Body Interior
Backlit Wooden Decorative Trim



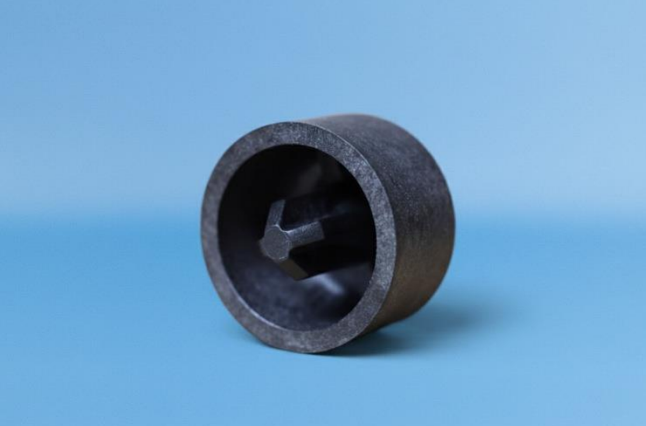
Body Interior
Integrated Light Pipe Carrier and Lens



Chassis/Hardware
Coolant Temperature Sensor



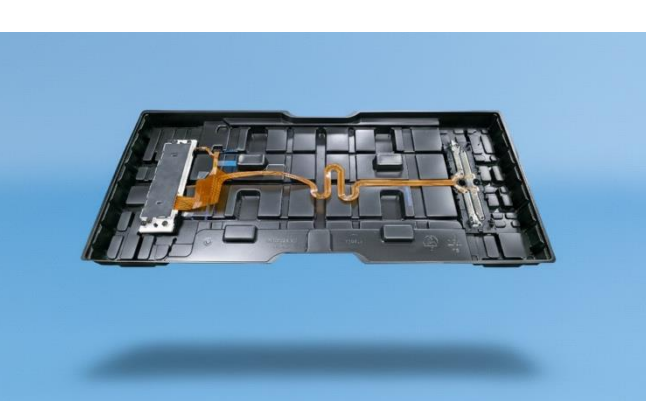
Chassis/Hardware
Integrated Seal Bumper Retainer



Chassis/Hardware
Transmission & Transfer Case Vent Cap



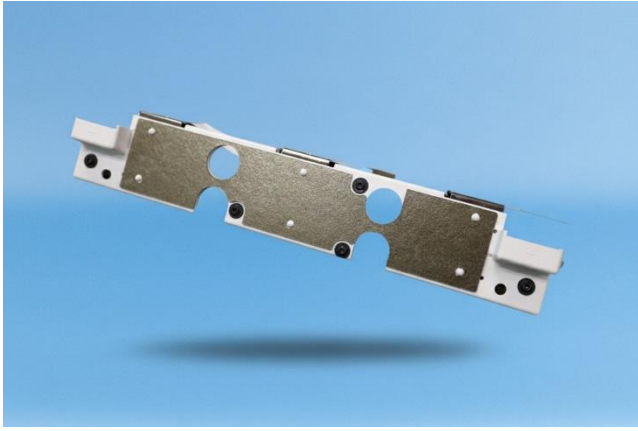
Electric and Autonomous Vehicle Systems
High Voltage Battery Pack Multifunctional Vent



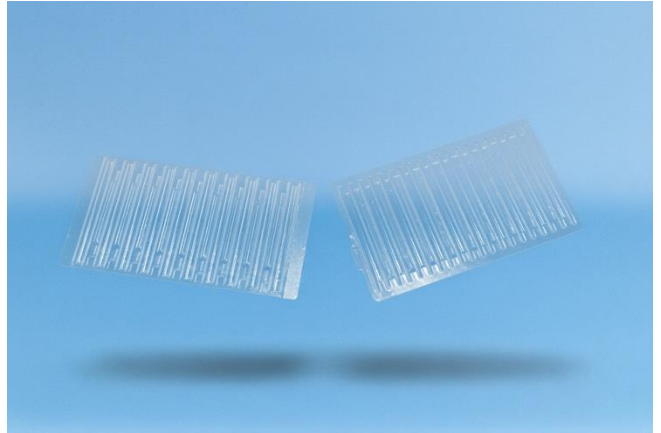
Electric and Autonomous Vehicle Systems
Interconnect Board Assembly

2025 IAG Finalists

High-resolution photos can be downloaded via Flickr: <https://flic.kr/s/aHBqjCwAL>



Electric and Autonomous Vehicle Systems
RESS Cell Tab Cooling Module



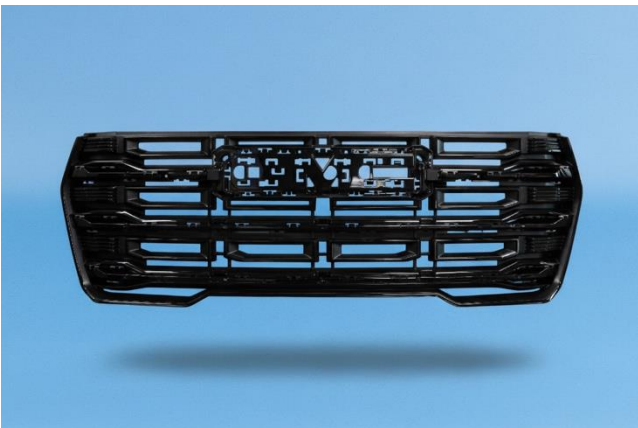
Electric and Autonomous Vehicle Systems
Battery Pack Weld Splatter Shield



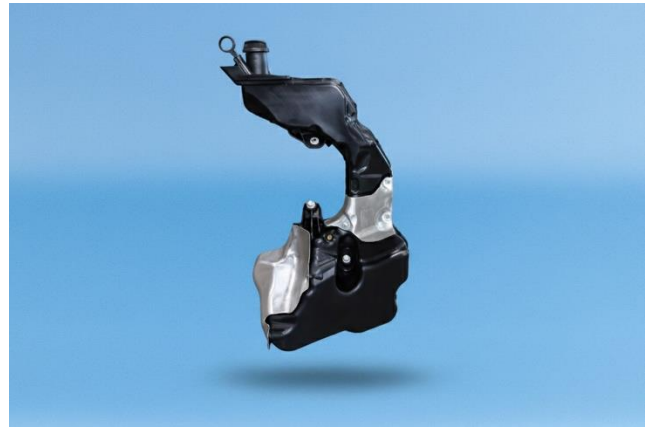
Materials
HVAC Outlets



Materials
Fluoropolymer for Engine Seals



Materials
High Gloss Black Grille



Powertrain
Dry Sump Tank



Powertrain
Thin Wall ETC Actuator Gears



Powertrain
Transmission Oil Pan

2025 IAG Finalists

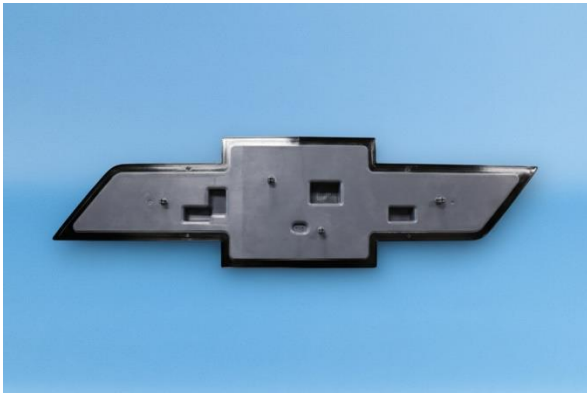
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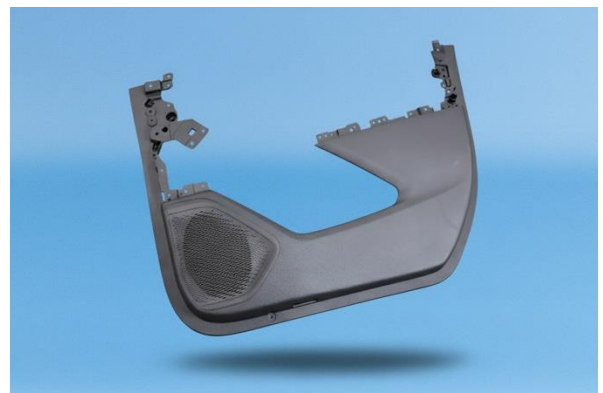
Process/Assembly/Enabling Technologies
Lit Applique



Process/Assembly/Enabling Technologies
Tail Lamp Piano Keys Lens



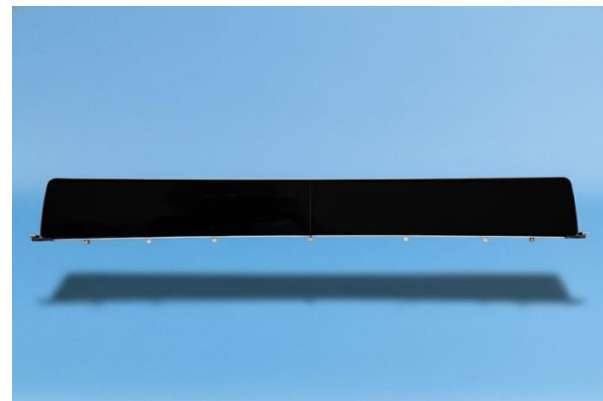
Process/Assembly/Enabling Technologies
Lit Badge



Process/Assembly/Enabling Technologies
Door Panel with Texture Matched Parting Line



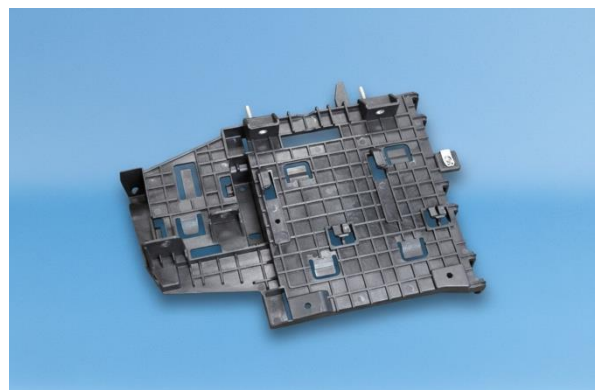
Safety
Carbon Fiber Hood



Safety
Integrated Dual Brightness Enhancement Film



Sustainability
Frunk & Rear Compartment



Sustainability
Carbon Neutral Carbon Black

2025 IAG Finalists

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Sustainability
Hydrocarbon Modified Wood/PP
Composites