



## FOR IMMEDIATE RELEASE: 5 November 2015

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## **SPE® AUTOMOTIVE DIV. NAMES FINALISTS FOR 45TH-ANNUAL AUTOMOTIVE INNOVATION AWARDS COMPETITION**

**TROY, (DETROIT) MICH.** – The Automotive Division of the Society of Plastics Engineers (SPE®) today announced the finalists for its 45th-annual ***Automotive Innovation Awards Competition***, the oldest and largest recognition event 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; that panel sent forward the most innovative nominations (category *finalists*) to the Blue Ribbon judging. Finalists from this year's competition are listed below in category and submission order.

### **CATEGORY: Aftermarket**

#### **• TRANSPARENT LIGHTWEIGHT WIND DEFLECTOR**

- **OEM Make & Model:** 2016 General Motors Co. Corvette Stingray convertible sports car
- **Tier Supplier/Processor:** Polytec FOHA Inc. / SABIC
- **Material Supplier / Toolmaker:** SABIC / Pace Machine Tool, Inc.
- **Material / Process:** Lexan 9043 PC with Exatec 900 coating / CNC-trimmed sheet
- **Description:** This is the first use of a self-mounted, transparent and frameless wind deflector for convertible cars that meets AS2 ANSI and ECE requirements. The steeply raked design minimizes air turbulence and noise when the top is down. Replacing glass with PC lowered mass 33% and allowed a contoured shape to be achieved that would have been difficult and costly in glass. A laser-etched monogram under the surface is unobtrusive to vision during driving, yet visible during inspection and meets regulatory requirements for glass marking. A plasma coating enhances scratch, chemical, and UV resistance for long use life.

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- **INTERIOR FLOORMAT**

- **OEM Make & Model:** 2015 General Motors Co. Chevrolet Colorado & GMC Canyon pickups
- **Tier Supplier/Processor:** Thermoflex Corp.
- **Material Supplier / Toolmaker:** Star Thermoplastic Alloys & Rubbers, Inc. / Thermoflex Corp.
- **Material / Process:** 90 Shore A proprietary TPE / injection molding
- **Description:** This genuine OEM part features divisional branding and offers customers better vehicle/carpet coverage (better 3D fit with more depth), better foot traction, better safety (uses common OEM retention system), and true color matching. The mats, which are injection molded from a proprietary 90 Shore A TPE, are 100% recyclable and easy to clean. Thanks to improved design flexibility, mats for the second row even feature a patent-pending 2-piece interlocking design that facilitates installation and removal and save 1.7 kg of weight per side for the second row.

## **CATEGORY: Body Exterior**

- **EMBLEM FRONT-CAMERA DEPLOYMENT MECHANISM**

- **OEM Make & Model:** 2016 Ford Motor Co. Lincoln MKX CUV
- **Tier Supplier/Processor:** Huf North America / Huf North America & Laudenbach Formtechnik GmbH & Co. KG
- **Material Supplier / Toolmaker:** Lanxess Corp., DuPont Automotive, BASF Corp., Celanese / Yantai Huf Tools Co. Ltd. & Laudenbach Formtechnik GmbH & Co. KG
- **Material / Process:** multiple / injection molding
- **Description:** To avoid blemishing the face of the vehicle with the mechanical appearance of an exposed camera, but satisfy the global customer, the camera had to be hidden and deployed only when required. Traditional deployable cameras were on the rear of vehicles and required bulky and heavy metallic housings and components. Front mounting required the lightest possible solution to avoid fascia deformation and vibration during road loads. Converting to an all-plastics mechanism saved 41-55% mass with no loss of function, allowed a camera washer nozzle to be hidden so camera is washed in stowed position, and led to multiple patent filings.

- **PUSH-TO-RELEASE EXTERIOR SERVICEABILITY FASTENER**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford Mustang sports car
- **Tier Supplier/Processor:** ITW Deltar Fasteners
- **Material Supplier / Toolmaker:** Ascend Performance Materials, LLC/ A&P Tool, Inc. & M&M Tool and Mold, LLC
- **Material / Process:** PA 6/6 / injection molding
- **Description:** Compared to other easy-service fasteners, which have twist heads to release, this injection-molded PA 6/6 fastener only requires that you push the center pin to the service position to remove. This fastener cannot back out or be removed from the installed position without deliberate actions by the customer. The pin and body are designed to not be easily separated; however, the fastener is reusable, unlike other push pins that become damaged in the process of removal. It meets EU lamp serviceability requirements, reducing the time needed to remove the fastener by 90% without tools.

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- **CHARGE-PORT BEZEL**

- **OEM Make & Model:** 2016 General Motors Co. Chevrolet Volt BEV
- **Tier Supplier/Processor:** ITW Deltar
- **Material Supplier / Toolmaker:** Celanese / ITW Deltar
- **Material / Process:** MetaLX Hostaform POM / injection molding
- **Description:** Thanks to use of elastic averaging, this injection-molded charge-port bezel is located very precisely with no gaps or movement normally associated with typical cantilevered snap-fit components. The application also used molded-in-color POM material, which provided the appearance of chrome without the cost or environmental concerns. Additionally, the design helped reduce labor to install and ensure the part was centered in the charge-port opening.

**CATEGORY: Body Interior**

- **2-SHOT MOLDED CRASH PAD GARNISH WITH 3D PATTERNS**

- **OEM Make & Model:** 2015 Hyundai Motor Group Kia KX3 CUV
- **Tier Supplier/Processor:** Hyundai Mobis / Dong Kook Ind. Co., Ltd.
- **Material Supplier / Toolmaker:** Samsung SDI / Woosung Precision Co., Ltd.
- **Material / Process:** Starex LX-0760 ABS / injection molding
- **Description:** This 2-shot injection-molded garnish features a transparent PC layer with unique, low-cost 3D patterns molded in and a second ABS layer with molded-in metallic color. The metallic ABS of the second layer showcases the 3D patterns molded into the transparent PC layer, creating an effect that cannot be reproduced using traditional decorative processes, such as insert-molded film, while lowering cost 56%. To eliminate weldlines and flow lines and improve the luminous appearance, size of the hybrid metallic flake system in the ABS was optimized and a hot/cool mold process was used.

- **COMPACT DRIVER'S SIDE BIN**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford Edge CUV
- **Tier Supplier/Processor:** Yanfeng USA Automotive Trim Systems Inc.
- **Material Supplier / Toolmaker:** Celanese, Advanced Composites, Inc., Ineos Group Ltd., & Trinseo / Circle 5 Tool & Mold Inc.
- **Material / Process:** Celcon UV140LG XAP &, LW90-52 POM, ADX 5017 TPO, Ineos HH1891 ABS, & Pulse 2000 EZ PC/ABS / injection molding
- **Description:** Thanks to a simple, non-binding, all-plastic rail system, this bin box is quiet, fully dampened, and requires no grease. The self-centering POM snap-in rail caps and molded-in lower stabilizing rails allow full extension of the bin drawer while providing smooth, durable function. No screws, mechanical fasteners, welding or heat staking were required in the mating process, eliminating secondary operations and lowering assembly labor.

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- **REAR-SEAT FOLDING HEAD RESTRAINT**
  - **OEM Make & Model:** 2015 Ford Motor Co. Ford F-150 pickup
  - **Tier Supplier/Processor:** Windsor Machine Group / Hawk Plastics Ltd.
  - **Material Supplier / Toolmaker:** ExxonMobil Chemical Co. / IRC Engineering
  - **Material / Process:** PP copolymer / injection molding
  - **Description:** This rear seat, folding head restraint eliminates a welded steel structure and replaces it with a single-piece, living hinge plastic core as its main structural component. As a result, thickness is reduced 33 mm for improved comfort and rear visibility; mass is reduced 624 g/vehicle, manufacturing complexity is significantly reduced (eliminating the need for special tooling processes thanks to consolidation of 5 parts into 1); tooling costs are lowered; and piece price is reduced \$1.50 USD/vehicle, while still meeting or exceeding all global safety requirements.
- **ACTIVE GLOVE BOX SYSTEM**
  - **OEM Make & Model:** 2016 Ford Motor Co. Lincoln MKX CUV
  - **Tier Supplier/Processor:** International Automotive Components Group
  - **Material Supplier / Toolmaker:** Advanced Composites, Inc., Mitsubishi IDK & IDC, & CGT / B&B Tooling Inc.
  - **Material / Process:** ADX 5028, Thermorun TT850N / Multiple
  - **Description:** To refine the active glove box system to meet luxury-segment customer expectations without losing functionality or safety, the door was hand wrapped and the inner door was flocked, eliminating cut lines for a separate airbag door. The occupant protection zone was increased by 35%, the inflator was precision tuned, and the bladder design was optimized, leading to a larger weld-surface area. A cost savings of \$8 USD/vehicle and a mass reduction of 2.25 lb/vehicle were achieved and the vehicle received a 5 Star Frontal Crash Impact rating.
- **TABLET HOLDER**
  - **OEM Make & Model:** 2016 Ford Motor Co. Ford Taurus midsize sedan
  - **Tier Supplier/Processor:** Lumens High Performance Lighting & Lear Corp.
  - **Material Supplier / Toolmaker:** BASF Corp. & DuPont Automotive / Multiple
  - **Material / Process:** Delrin 500P POM, Ultramid B3ZG3 PA 6, Santoprene 65M300 TPE, Hostacom ERC 213N TPO, Pro-fax 7823 PP, and Hostacom X M2 U34 PP / injection molding
  - **Description:** This seat-back mounted tablet docking station and charger allows for smooth, 1-handed loading/unloading of a tablet (or other 12 V-powered devices). The unit meets OEM head-impact requirements (will not fragment or release during impact) and has a range of automatic and synchronized convenience features that are totally new to the tablet holder market. When not in use, the holder rotates downward and stows tightly in the seat back and a tambour door covers the lock if no device is in use.

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## **CATEGORY: Chassis/Hardware**

### • **CARBON COMPOSITE GRILLE-OPENING REINFORCEMENT**

- **OEM Make & Model:** 2016 Ford Motor Co. Shelby GT350 Mustang sports car
- **Tier Supplier/Processor:** Magna Exteriors / Plastcoat Div. of Magna International
- **Material Supplier / Toolmaker:** BASF Corp. / Tycos Tool & Die Co.
- **Material / Process:** Ultramid A3WC4 PA 6/6 / injection molding & resistant implant welding
- **Description:** This is the first GOR panel using short carbon fiber-reinforced PA 6/6 and the unique joining process of resistant implant welding (RIW) to produce a highly structural and lightweight part from a 2-piece injection-molded box section design. Versus the plastic-metal hybrid construction it replaced, the new material/process eliminated 5 steel stampings, reducing costs 75% and mass 24% (2.5 lb). Aesthetics also were improved, which allowed elimination of the beauty cover with its associated labor, cost, and weight, and the VOC emissions associated with rust-coating the steel stampings. Further, NVH values were improved by 2 Hz.

### • **ENGINE-ROOM PARTITION WALL**

- **OEM Make & Model:** 2015 Hyundai Motor Group Hyundai Genesis coupé
- **Tier Supplier/Processor:** NVH Korea
- **Material Supplier / Toolmaker:** KOPLA / Hyundai Motor Co.
- **Material / Process:** KoplA KDX 1065 PA 6/6 / injection molding
- **Description:** This all-plastic engine-room partition wall provides excellent sound insulation between engine and passenger compartments thanks to the use of long-glass PA 6/6 with barium sulfate. Replacing stamped steel plus a sound-deadening pad, the patented injection-molded plastic partition reduces engine noise 8 dB, lowers part count and assembly time, and offers a 20% weight reduction without increasing costs.

### • **DOOR PROTECTION DEVICE**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford Focus All Models
- **Tier Supplier/Processor:** WITTE Automotive
- **Material Supplier / Toolmaker:** DuPont Automotive / WITTE Automotive
- **Material / Process:** Delrin POM, PA 7, PP / injection molding
- **Description:** This articulating plastic door-edge protector extends when the door opens, helping prevent damage to the door and other nearby vehicles. By reducing door dings and dents, \$1.5MM USD warranty paint repairs can be saved plus another \$500K USD indirect cost due to prevention of damage during shipping. It also helps maintain craftsmanship of the vehicle over its use life.

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- **FIBERGLASS/EPOXY COMPOSITE COIL SPRING**

- **OEM Make & Model:** 2015 Audi AG Audi A6 Avant wagon
- **Tier Supplier/Processor:** S. Ara Composite S.A.S.
- **Material Supplier / Toolmaker:** Hexion Inc. / not stated
- **Material / Process:** Epikote epoxy + fiberglass /modified filament winding
- **Description:** This weight-saving epoxy/fiberglass composite coil spring is the first of its kind to be used in the suspension system of a series-production vehicle. Using a patented, modified filament winding process, the application replaced traditional steel coil springs, reducing weight 40% and enabling the suspension system to react more quickly to changing road surface conditions, thereby improving vehicle handling and NVH. Significant work was done on resin chemistry and resin/fiber interface to ensure efficient load transfer and long-term mechanical performance, as well as finding an efficient, cost-effective production method capable of meeting build volumes.

## **CATEGORY: Environmental**

- **NATURAL FIBER-REINFORCED PP**

- **OEM Make & Model:** 2013 PSA Peugeot Citroën Peugeot 308 hatchback
- **Tier Supplier/Processor:** Faurecia Interior Systems
- **Material Supplier / Toolmaker:** Automotive Performance Materials - APM/ not stated
- **Material / Process:** Naflean PF2 natural PP +20% natural fiber / injection molding
- **Description:** This 20% hemp-filled PP reduces part weight up to 25% vs. higher density glass-reinforced PP and allows wall stock to be lowered to 2 mm. Thanks to the 20% bio content, this also reduces the part's CO2 emissions 20% during its use life. The material is fully recyclable, and can be processed on conventional molding machines at lower energy consumption.

- **SEAT FABRIC FROM RECYCLED MATERIALS**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford F-150 pickup
- **Tier Supplier/Processor:** Johnson Controls Inc. / Sage Automotive Interiors
- **Material Supplier / Toolmaker:** Unifi Manufacturing, Inc. / not stated
- **Material / Process:** Repreve PET / Multiple
- **Description:** The fiber used in this innovative seat fabric is made from a hybrid blend of 100% recycled materials, including post-industrial fiber and post-consumer water bottles. The fabric meets Ford design and comfort requirements without any compromise in quality, durability, or performance. The switch from virgin fiber was achieved at cost parity, while providing significant environmental benefits, including diverting over 5-million water bottles from landfills just this year. To help close the loop further, there are now PET bottle collection bins installed at the Ford Research & Engineering campus, which are recycled to help form this fiber.

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- **UNDERBODY AERO SHIELDS**

- **OEM Make & Model:** 2016 Ford Motor Co. Ford Fusion midsize sedan
- **Tier Supplier/Processor:** US Farathane Corp.
- **Material Supplier / Toolmaker:** US Farathane Corp.
- **Material / Process:** PET fibers / compression molding
- **Description:** In this application, underbody shields using virgin glass/PP LWRT composites were replaced by a material made from PET fibers, half of which were sourced from recycled water bottles. The result was lower cabin noise/better acoustics, better thermal performance, a 2% cost savings, and a more environmentally responsible solution.

- **PCR CAM COVER**

- **OEM Make & Model:** 2015 Ford Motor Co. Nano 2.7L and 3.5L IVCT GTDI engines
- **Tier Supplier/Processor:** ElringKlinger North America, Inc. / Bruss North America Inc.
- **Material Supplier / Toolmaker:** Wellman Advanced Materials / not stated
- **Material / Process:** EcoLon GF1960 PA 6/6 (100% PCR) / injection molding
- **Description:** This is the first time a 100% post-consumer recycled PA 6/6 resin with 33% short-glass reinforcement has been used for a demanding cam cover application to replace die-cast aluminum. The PCR PA 6/6 offered excellent weldability to attach a high-efficiency air-oil separator and was molded in very-thin walls (to 2.0 mm for the Nano-model cover). The result is a part that is 30% lighter than incumbent aluminum, offers lower NVH values and a 20% material cost reduction vs. virgin resin, and diverts carpet from landfills.

## **CATEGORY: Materials**

- **ULTRALIGHT CLASS A BODY PANELS**

- **OEM Make & Model:** 2016 General Motors Co. Chevrolet Corvette sports car
- **Tier Supplier/Processor:** Continental Structural Plastics
- **Material Supplier / Toolmaker:** Continental Structural Plastics / Century Tool & Gage, Paragon Die & Engineering Co.
- **Material / Process:** TCA Ultra Lite SMC / compression molding
- **Description:** A new 1.2 SG SMC eliminated 9 kg of body-panel weight after a running change from a mid-density grade, where no tooling changes were required. Suitable for Class A or structural components, the new composite offers 28% mass reduction vs. mid-density (1.6 SG) grades and 43% vs. conventional (1.9 SG) SMC. It provides greater benefits vs. metal, including reduced weight and tooling costs, enhanced design flexibility, corrosion and dent resistance, and superior surface finish. Key to achieving the ultralow density was replacement of CaCO<sub>3</sub> with hollow-glass microspheres and use of a proprietary surface treatment to improve the resin/reinforcement interface.

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- **CARBON COMPOSITE WHEEL**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford Mustang Shelby sports car
- **Tier Supplier/Processor:** Carbon Revolution
- **Material Supplier / Toolmaker:** not stated / Carbon Revolution
- **Material / Process:** carbon fiber-reinforced composite /resin transfer molding
- **Description:** This is the first high-volume OEM carbon composite wheel designed to meet all OEM requirements and quality standards, and produced and sold with full warranty coverage. The one-piece wheel is molded by resin transfer molding over a dry carbon fiber preform, then fully infused with a proprietary resin. Hollow core spokes are designed to provide maximum wheel stiffness, and aluminum lug seats and backer plate sandwich the carbon composite structure for a robust joint. An embedded RFID chip in the spoke allows manufacturing and quality history for each wheel to be tracked. Weight and rotational inertia are significantly reduced.

- **REAR LAMP REFLECTOR**

- **OEM Make & Model:** 2015 FCA US LLC Dodge Challenger sports car
- **Tier Supplier/Processor:** Varroc Lighting Systems
- **Material Supplier / Toolmaker:** SABIC/ not stated
- **Material / Process:** Lexan LUX 2289 PC / injection molding
- **Description:** Rear lighting plays an important safety and branding role. New lighting technologies have been combined with plastics to create innovative new designs, such as this rear lamp with unique lit and unlit appearance. The system uses high specular and diffuse reflection from multiple LEDs to create a homogeneous light glow. Thanks to a special color additive, the white polymer's high reflectivity after molding and heat aging, and minimal color shift eliminates the need for direct metallization or painting. Injection molding also enables design features like clips to be integrally molded close to LED circuit boards.

## **CATEGORY: Powertrain**

- **HEATED-TIP FUEL INJECTOR**

- **OEM Make & Model:** 2015 Honda Motor Co. Honda Fit subcompact and City sedan
- **Tier Supplier/Processor:** Delphi Powertrain
- **Material Supplier / Toolmaker:** DuPont Automotive / Coltelleria Baldi
- **Material / Process:** Zytel HTN54G35EF BKB336 PPA / injection molding
- **Description:** An electrical heater within the injector is energized by the vehicle controller, rapidly heating the ethanol fuel and dramatically improving vaporization while reducing emissions. Ink materials used in construction of the heater, body design, the ink-printing process on the body, and overmolding with PPA (which was designed for flow, heat resistance, and electronic compatibility) were all key to the success of this application. The technology saved \$60 USD/vehicle as well as 8.8 kg, while improving cold starts on E100 fuel and eliminating the need for a redundant gasoline fuel system on the vehicle.

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- **TRANSMISSION HEAT EXCHANGER CRADLE**

- **OEM Make & Model:** 2015 Ford Motor Co. Lincoln MKC CUV
- **Tier Supplier/Processor:** A. Raymond Tinnerman
- **Material Supplier / Toolmaker:** SABIC / not stated
- **Material / Process:** Noryl GTX 840 PPE/PA 6/6 / injection molding
- **Description:** A streamlined snap-fit design of a structural cradle eliminated the need for metal fasteners and typical welded/bolted on metal designs. This led to significant cost savings thanks to lower assembly time for the cradle itself and the entire front engine module consisting of 15 components. By eliminating the corrosion risk associated with die-cast aluminum and stamped steel in conventional designs, the MPPE/PA unit improves structural performance at elevated temperatures, and saves cost and weight vs. specialty materials.

- **EXTERNAL AIR OIL SEPARATOR**

- **OEM Make & Model:** 2015 General Motors Co. Chevrolet LT1 Camaro SS sports car & Cadillac LT4 CTS-V sedan
- **Tier Supplier/Processor:** ElringKlinger North America, Inc.
- **Material Supplier / Toolmaker:** DuPont Automotive / not stated
- **Material / Process:** Zytel PLS95G35DH1 PA / multiple
- **Description:** Multiple manufacturing technologies, including injection molding, vibration welding, and spin welding, were all used to create a new design that achieved superior oil separation in very limited package space. The resin's special oxidation-barrier technology helps preserve mechanical properties at elevated temperatures and prolong the unit's service life.

### **CATEGORY: Process/Assembly/Enabling Technologies**

- **PRESS BONDING WITH EDGE FOLDING & CNC DECO STITCH**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford F-150 pickup
- **Tier Supplier/Processor:** Faurecia Interior Systems
- **Material Supplier / Toolmaker:** Haartz Corp./ FRIMO Group GmbH
- **Material / Process:** multiple / multiple
- **Description:** A combination of high-speed decorative stitching and press lamination with automatic edge folding and wrapping helped bring the look and quality of cut-&-sew and hand wrapping to a high-volume production vehicle. The innovative new process combination saves approximately 8 oz of weight by using lightweight TPO skins instead of heavier PVC, 10% scrap, 55% cycle time, \$10 USD/vehicle direct costs, and approximately \$1-million USD in tooling savings.

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- **BLOW-MOLDED SPOILER ASSEMBLY**

- **OEM Make & Model:** 2016 General Motors Co. Cadillac ATS V Series
- **Tier Supplier/Processor:** Metelix Products, Inc.
- **Material Supplier / Toolmaker:** Trinseo / Metelix Products, Inc.
- **Material / Process:** Magnum 1250BG ABS / blow molding
- **Description:** This blow-molded spoiler features a complex triangular-shaped design and 1-piece construction while maintaining uniform wall thickness and product integrity. Achieving the complex deep-draw features required a unique 3-piece tool including a large slide that extends the entire rear edge of the mold cavity. Timed slide operations enabled the parison to expand with minimal stretch, and laser venting improved air evacuation for wall-thickness control. The final part meets aggressive styling objectives at 10% cost and 20% weight savings vs. conventional blow molding.

- **IMX INSTRUMENT PANEL**

- **OEM Make & Model:** 2014 Hyundai Motor Group Hyundai i20 supermini
- **Tier Supplier/Processor:** Hyundai-Mobis / HanilEhwa
- **Material Supplier / Toolmaker:** Hanwha L&C / Hyundai-Motor Co.
- **Material / Process:** Multiflex 3202 TPO / compression-injection molding
- **Description:** To eliminate scratches and a hard "plastic" feel, a 2-shot compression-injection soft IP was developed. The back-foamed TPO foil is compression-injected with the PP substrate, which in turn is integrally injection molded with the TPO passenger-side airbag door. All the work is done in a single tool. To increase foam softness and stability of the integral injection molding, the TRIZ method and design of experiments tools were used. The resulting part saves \$10 USD/vehicle and reduces mass 300 g.

- **2-SHOT SELECTIVE CHROME & PAINT FINISH PANELS**

- **OEM Make & Model:** 2016 Ford Motor Co. Ford Explorer SUV
- **Tier Supplier/Processor:** Summit Polymers, Inc. / Lawrence Automotive Interiors Ltd.
- **Material Supplier / Toolmaker:** SABIC / not stated
- **Material / Process:** Cyclicolac ABS, Cyclicoloy PC/ABS / injection molding
- **Description:** To meet program direction for a multi-colored finish panel within the same package space (without incremental space for attachments) meant a 2-shot selective chrome and paint solution in a single molded piece with similar materials was needed. In the first shot, PC/ABS is injected into a dual cavity tool on a rotary platen. In the second shot, a very-thin plateable ABS grade is overmolded. Dip plating plus masking and painting offer numerous finish options with lower gloss over plating and MIC applications. The result achieves a very-good bond, has zero-margin gap, and no BSR issues.

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- **DOOR-TRIM SWITCH BEZEL**

- **OEM Make & Model:** 2016 Ford Motor Co. Ford Edge CUV
- **Tier Supplier/Processor:** Yanfeng USA Automotive Trim Systems Inc.
- **Material Supplier / Toolmaker:** BASF Corp. / Michael Tool & Mold (Windsor) Ltd.
- **Material / Process:** Ultramid A3L PA 6/6 / injection molding
- **Description:** By combining a heated mold and a special stainless-steel cavity with extra cooling on the grained surface, it was possible to create the look of 2 parts (one in high-gloss piano black and one in a low-gloss grained surface) in a single tool while achieving impeccable fit and finish and craftsmanship. This eliminated the need to mold multiple parts and/or paint, saved 200 g and \$4 USD/vehicle, and eliminated the VOCs and cost of a painting operation.

**CATEGORY: Safety**

- **DIRECT FASCIA-MOUNTED SENSOR**

- **OEM Make & Model:** 2015 Ford Motor Co. Ford Mustang sports car
- **Tier Supplier/Processor:** MacLean-Fogg Co. & Ford Motor Co. / MacLean-Fogg Co.
- **Material Supplier / Toolmaker:** LyondellBasell / Industrial Automation LLC
- **Material / Process:** Hifax TYC 852X TPO / injection molding
- **Description:** A flexible pedestrian-protection crash sensor bracket injection molded in plastic with an embedded metal stud is sonically welded directly to the fascia skin to decrease signal noise and improve response time of the deployable hood system. The flexibility of the design helps the bracket to conform to different fascia contours, allowing for a single bracket design to be used in multiple locations on the same vehicle, or across different vehicle lines. The final design saved 1 lb and \$5 USD/vehicle and allows the hood to deploy faster for greater pedestrian safety.

- **FLOOR ROCKER REINFORCEMENT**

- **OEM Make & Model:** 2015 FCA US LLC Jeep Renegade SUV
- **Tier Supplier/Processor:** Proma Group / Redstamp
- **Material Supplier / Toolmaker:** SABIC / Redstamp
- **Material / Process:** Noryl GTX 910 MPPE/PA / injection molding
- **Description:** An optimized MPPE/PA 6 honeycomb geometry in a plastic/metal hybrid proved to be a very efficient energy-absorbing crash-box structure in this floor rocker reinforcement. Not only is the component E-coat capable, but it is very easy to assemble into the vehicle's BIW. Since the plastic honeycomb is integrally attached to 2 steel flanges during injection molding, no structural adhesives are needed. The mixed-material solution took 1 kg of weight out of the BIW, saved approximately 10%, and contributed tooling savings vs. previous steel solutions.

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- **UNIDIRECTIONAL INERTIAL LOCKOUT**

- **OEM Make & Model:** 2016 Ford Motor Co. Lincoln MKC luxury sedan
- **Tier Supplier/Processor:** International Automotive Components Group / West Michigan Molding, Inc.
- **Material Supplier / Toolmaker:** Celanese / not stated
- **Material / Process:** Celcon LW90-S2 POM / injection molding
- **Description:** This console bin door has no latch in the closed position, but a unidirectional inertial lockout feature was implemented to meet FMVSS 201. The lockout's inertial sensitivity is defined by part geometry, allowing it to be made of any material while maintaining the same inertial properties. A single injection-molded snap-in lever plus felt tape replaced multiple die-cast metal components, minimizing testing costs due to compliance the first time, increasing reliability, and saving 7.85 g and \$0.84 USD costs vs. the previous metal option.

Category and Grand Award winners selected from among these finalists during the Blue Ribbon judging by a group of journalists, academics, and retired industry chief engineers will be announced at the ***Automotive Innovation Awards Gala*** on **November 11, 2015** during the 45th-annual SPE ***Automotive Innovation Awards Gala*** at Burton Manor in the suburbs of Detroit. The event begins with the VIP Cocktail Reception at 4:30 p.m., generously sponsored by Celanese. At 5:00 p.m. the main exhibit area will open for general admission and guests can review all of this year's ***Automotive Innovation Awards*** part nominations, as well as enjoy the specialty and antique vehicles that are always a highlight of the show. Dinner will begin at 6:30 p.m. and the awards program itself will run from 7:00-9:00 p.m. For those who wish to extend merrymaking and networking activities, the ever-popular *Afterglow* – also sponsored by Celanese – will run from 9:00-11:00 p.m.

***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*. This annual event typically draws over 700 OEM engineers, automotive and plastics industry executives, and media. As is customary, funds raised from this event are used to support SPE educational efforts and technical seminars, which help educate and secure the role of plastics in the advancement of the automobile.

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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 Innovation Awards Competition and Gala*** see <http://speautomotive.com/inno> and <http://speautomotive.com/awa>. For more information on the ***Society of Plastics Engineers***, see [www.4spe.org](http://www.4spe.org).

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*Attn. Editors: A large collection of SPE Automotive Division digital photography is available for download at <http://www.flickr.com/photos/speautomotive/collections>. Photos of all of the parts nominated for this year's SPE Automotive Innovation Awards Competition (including these finalists) will be found here sorted by category:*

<https://www.flickr.com/photos/17968829@N03/collections/72157660756291642/>.