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**SPE® AUTOMOTIVE DIV. NAMES WINNERS FOR 49TH ANNUAL
 AUTOMOTIVE INNOVATION AWARDS COMPETITION**

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Troy, (DETROIT) MICH.— The Automotive Division of the Society of Plastics Engineers (SPE®) today announced the winners for its 49th annual ***Automotive Innovation Awards Competition***, the oldest and largest recognition event in the automotive and plastics industries. The announcement was made November 6, 2019 during the 49th annual SPE Automotive Innovation Awards Gala held at the Burton Manor in Livonia, Mich., USA. The Body Exterior category winner was also this year's Grand Award winner. The Grand Award winner is selected from the winners of each of 9 categories by a panel of Blue Ribbon Judges who are industry experts. A Vehicle Engineering Team Award (VETA) was also announced. The VETA honors work in research, design, engineering, and/or manufacturing that has led to the significant integration of polymeric materials on a notable vehicle. The Hall of Fame (announced in October 2019) and Lifetime Achievement (announced in August 2019) awards were also presented.

This year's winners are:

CATEGORY WINNER: Additive Manufacturing

Sunglass Bin

- **OEM Make & Model:** 2020 Ford Motor Co. Ford Explorer SUV
- **Tier Supplier / Processor:** Methode Electronics, Inc. / Methode Electronics, Inc.
- **Material Supplier / Toolmaker:** Celanese Corp. / RGM Tooling Consultants, Inc.
- **Material / Process:** Celstran PP-GF20-02 LFT-PP / Injection Molding; 3D Printed H13 Steel

Description: Additive Manufacturing was used to produce a single tooling insert (lifter) that replaced 2 conventionally machined lifters to mold an injection molded sunglass stowage bin. That enabled design changes to produce a deeper pocket with a heavier undercut that still could be molded without hotspots, warpage, or demolding issues and without needing to switch to a more costly resin. The new deeper bin design also better meets customer requirements while reducing cycle time, molding scrap, tooling maintenance, and improving dimensional stability in the final part.

CATEGORY WINNER: Aftermarket and Limited Edition/Specialty Vehicles

Multiple Additively Manufactured Components

- **OEM Make & Model:** 2020 Jaguar Land Rover Ltd. Jaguar XE SV Project 8 supercar
- **Tier Supplier / Processor:** HP Inc. / Jaguar Land Rover Ltd.
- **Material Supplier / Toolmaker:** HP Inc., DyeMansion GmbH / N/A
- **Material / Process:** HP High-reusability PA 12 / HP Multi Jet Fusion

Description: Additive manufacturing proved the most efficient and cost-effective method for producing 19 parts on this high-performance sedan whose total build volume will be limited to 300 cars. Both development and production parts were produced on the same printer platform, which eliminated significant tooling investment (est. at \$123,000 USD), as well as storage and maintenance costs. All 19 parts print at one time in a kit, and multiple kits can be produced at the same time. Additionally, parts offer better bonding adhesion than conventionally produced parts and passed paint adhesion tests.

GRAND AWARD & CATEGORY WINNER: Body Exterior

Composite Pickup Box

- **OEM Make & Model:** 2020 General Motors Co. GMC Sierra LD FST pickup
- **Tier Supplier / Processor:** Continental Structural Plastics/Continental Structural Plastics
- **Material Supplier / Toolmaker:** Teijin Ltd./Paragon D&E, Model Die & Mold, Inc., Altron Automation, & Legacy Industries
- **Material / Process:** Sereebo A235Y carbon fiber-reinforced PA6 sheet / Compression Molding

Description: This is industry's first pickup box in thermoplastic composite and carbon composite. It saved 62 lb/28 kg, provided best-in-class impact resistance/durability, the unpainted UV-stable material eliminated the need for a bedliner (saving another 40 lb/18 kg), and numerous customer features were molded in, including functional compartment dividers and motorcycle tire pockets. The ability to achieve a deeper draw during molding increased cargo capacity. Significant technical challenges were overcome due to use of novel materials, processes, coatings and joining methods. The box is fully recyclable and some scrap is reused on the vehicle.

CATEGORY WINNER: Body Interior

Integrated Button Carrier Modular Strategy

- **OEM Make & Model:** 2020 Ford Motor Co. Explorer/Aviator/Corsair SUVs
- **Tier Supplier / Processor:** Methode Electronics, Inc. / Methode Electronics, Inc.
- **Material Supplier / Toolmaker:** The Materials Group / RGM Tooling Consultants, Inc.
- **Material / Process:** Opticarb 8085SE PC/ABS / Injection Molding

Description: To reduce overhead console complexity, a new design was developed that integrated mechanical, lighting, electrical, and safety functions into a single modular button carrier injection molded from MIC PC/ABS. With all program variants, this reduced part count from 70 to 17/vehicle, achieved a \$7 USD cost savings/vehicle and \$1.42-million USD program savings for tooling and testing. No button binding issues have been seen, BSR was improved, and the headliner fit better. To date, 2 patents have been filed and one has been granted on this technology.

CATEGORY WINNER: Chassis/Hardware

Rear-Differential Front Bracket

- **OEM Make & Model:** 2020 FCA NA LLC Jeep Cherokee SUV
- **Tier Supplier / Processor:** Boge Rubber & Plastics / Boge Rubber & Plastics
- **Material Supplier / Toolmaker:** BASF Corp. / N/A
- **Material / Process:** Ultramid A3WG10CR 50% GR-PA 6/6 / Injection Molding

Description: A critical diecast and machined aluminum bracket was replaced by an injection molded bracket in 50% GR-PA 6/6 in this demanding rear differential module. The composite material was not only 30% lighter and saved \$1 USD/car direct costs vs. the benchmark aluminum, but its matrix provided 10x higher damping, improving NVH performance, and it fit current packaging space for this running change. The part passed all performance and durability requirements, eliminated corrosion issues, and will significantly reduce tooling costs over the life of the program.

CATEGORY WINNER: Environmental

100% PCR Carbon Canister Housing

- **OEM Make & Model:** 2019 Ford Motor Co. Ford Mustang Sports Car
- **Tier Supplier / Processor:** Delphi Technologies PLC / MGS Mfg. Group
- **Material Supplier / Toolmaker:** Wellman Advanced Materials / MGS Mfg. Group
- **Material / Process:** EcoLene PP8004-BK1 20% GR-PP / Melt Compounding & Injection Molding

Description: The PP backing from PCR carpeting is given another use life by being recycled back into the injection molded carbon canister housing for passenger cars. This is the first 100% PCR PP-based carbon cannister. By replacing virgin PP, the recycled resin reduces cost 25% with no sacrifice to processing or molded-part performance, but increases sustainability. It is currently being rolled out on more than 20 Ford programs globally.

CATEGORY WINNER: Materials

Glass Wool-Reinforced Composites for Improved Scratch Resistance

- **OEM Make & Model:** 2017 Hyundai Motor Co. Hyundai Elantra sedan
- **Tier Supplier / Processor:** Seoyon E-Wha / Seoyon E-Wha
- **Material Supplier / Toolmaker:** Daehacom Co., Ltd. / Seoyon E-Wha
- **Material / Process:** SW920 SA glass wool-reinforced PP / Injection Molding

Description: To improve both long-term scratch resistance and dimensional stability in injection molded PP interior trim panels, glass wool (crushed glass + sand produced from reclaimed/PIR building insulation) was used to replace talc, whiskers, and fiberglass. Because glass wool boosts mechanical properties vs. talc, filler content was reduced 5%, leading to lighter, less costly parts. Since it helps maintain surface finish longer, it should lower warranty claims. A unique process was developed to incorporate glass wool into the resin compound. Glass wool is difficult to dispose of, so this application gives it another use life.

CATEGORY WINNER: Powertrain

Transmission Gear Shroud

- **OEM Make & Model:** 2017 Ford Motor Co. Ford F-150 pickup
- **Tier Supplier / Processor:** Stackpole International / MacLean-Fogg Co., Engineered Plastics Components Inc.
- **Material Supplier / Toolmaker:** DuPont de Nemours, Inc. / Gibson Automation
- **Material / Process:** Hytrel 8238 TPC-ET / Injection molding

Description: A new transmission gear shroud cover and base protect the drive gear so it rotates freely without needing to push through transmission fluid, lowering effort, improving pump efficiency, and increasing vehicle MPG and the effective life of the transmission fluid. Injection molded TPC-ET replaced earlier steel covers with rubber seals that were heavier, more complex and costly, and suffered from more variation. Very aggressive snap fits permanently join cover to base once the assembly is completed. The same material molded very-thin provides a ductile seal. Costs were reduced 22%, weight lowered 65%, and NVH was improved.

CATEGORY WINNER: Process / Assembly / Enabling Technologies

Rear Bumper

- **OEM Make & Model:** 2020 General Motors Co. Chevrolet Corvette sports car
- **Tier Supplier / Processor:** Shape Corp. / Shape Corp.
- **Material Supplier / Toolmaker:** SGL Carbon SE, VectorPly Corp., Scott Bader Co. Ltd. / Thomas GmbH + Co. Technik + Innovation KG
- **Material / Process:** Crestapol 1250 PUR-acrylate reinforced with CF / Radius-Pultrusion

Description: The auto industry's first pultruded curved bumper beam uses the unique radius-pultrusion process and equipment to achieve a hollow beam with central web in carbon fiber fabric-reinforced polyurethane/acrylate resin. The curved geometry was desired to better match rear styling and vehicle package space. The beam features an integral tow hook mounting and is assembled to the body-in-white (BIW), requiring excellent mechanicals at elevated temperature. The beam meets low-speed crash requirements while cutting mass by 4.9 lb/2.2 kg vs. a metal-inert gas (MIG) welded aluminum extrusion. 3D printing was used to produce mandrels to maintain the hollow interior.

CATEGORY WINNER: VEHICLE TEAM ENGINEERING AWARD

The composites-intensive 2020 model year (MY) *Chevrolet Corvette* Stingray sports car from General Motors Co. (Detroit) was selected as the winner of this year's Vehicle Engineering Team Award (VETA). The VETA award was created in 2004 to recognize the technical achievements of entire teams — comprised of automotive designers and engineers, tier integrators, materials suppliers, toolmakers, and others — whose work in research, design, engineering, and/or manufacturing has led to significant integration of polymeric materials on a notable vehicle. Nine innovative part nominations, in this year's program, were for parts or components on the new Corvette. Two of the nominations were category finalists and one was a category winner.

CATEGORY WINNER: HALL OF FAME

The first Plastic-Metal Hybrid (PMH) front end structure, used on the 1999 C170 Ford Focus GOR from Ford Motor Company, was named the 2019 Hall of Fame winner. The plastic-metal front end structure, made with Durethan® BKV30H2.0 (30% glass filled PA6/heat stabilized) resin from LANXESS (formerly Bayer from 1999-2004) with a steel insert enabled a 40% weight reduction, 30%

cost reduction, high function integration with reduced process steps, higher accuracy and quality, and higher load capacity compare to a 100% steel structure. To be considered for a Hall of Fame Award, an automotive plastic or composite component must have been in continuous service in some form for at least 15 years and broadly adopted in the automotive industry. This application certainly qualifies as there have been more than 70 applications and 70 million manufactured parts to date worldwide. The companies involved in developing the first PMH front end application include: OEM – Ford Motor Co.; System Supplier – Visteon; Molder/Processor – Visteon; Toolmaker – Misslbeck; and Material Supplier – LANXESS (formerly Bayer). Boris Koch is the inventor and designer of the PMH innovation with Bayer/ LANXESS and Dr. Hubert Goldbach is the inventor and designer for the PMH innovation with Bayer.

CATEGORY WINNER: LIFETIME ACHIEVEMENT

Michael J. Whitens, retired former Global Director for Ford's Vehicle and Enterprise Sciences at Ford's Research and Innovation Center, was named the 2019 ***Lifetime Achievement Award*** Winner. In his most recent role at Ford (2014 – 2018) he led the development of technology strategy and implementation in support of emerging areas including plastics/polymers, advanced plastics processing technologies, composites and material formulations with responsibility for over 500 researchers at three Ford Motor Company global facilities.

Whitens demonstrated expertise working on several advanced plastics processes including micro-cellular foaming, long-fiber thermoplastic (D-LFT) composites, natural fiber composites, carbon fiber composites, nano additive based composites, metal-plastics hybrid molding, co-injection molding, twin screw extrusion compounding, polyurethane foams and more. His work includes the development of several innovations for numerous automotive plastics applications, ranging from interiors and exteriors to under the hood and safety – including instrument panels, door panels, door modules, molded-in-color, seating, NVH foams, fuel systems components and more.

An automotive industry veteran with over 30 years of experience, Whitens has spent the majority of his career at Ford Motor Company in various body engineering disciplines. He also spent three years as the Mustang PVT (Platform Vehicle Team) manager, bringing the second-generation Bullitt and Mach 1 to life.

He is a recognized leader in the development of innovative technologies in the automotive field, with 35 patents in many areas of component innovation, new material development, safety, body interior, exterior and vehicle execution.

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 800 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.

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 www.speautomotive.com. For more information on the **Society of Plastics Engineers**, see www.4spe.org.

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