



FOR IMMEDIATE RELEASE: 6 November 2013

Media Contact:

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SPE® AUTOMOTIVE DIV. NAMES WINNERS OF 43RD-ANNUAL AUTOMOTIVE INNOVATION AWARDS COMPETITION

TROY, (DETROIT) MICH. – For the 43rd year in a row, members of the SPE® Automotive Division's board of directors and guests from the global automotive and plastics industries gathered to honor the year's *most innovative use of plastics* in ground transportation at the **SPE Automotive Innovation Awards Gala**. Over 700 people attended the annual banquet on **November 6, 2013**, at **Burton Manor** in Livonia, Mich. to learn which applications in this year's **Automotive Innovation Awards Competition** won awards in eight categories, and which category winner was also named the Grand Award winner, the most prestigious honor of the evening.

Winners survived a prequalification round as well as presentations before a panel of industry experts on September 26 and 27. Finalists from that round presented before a Blue Ribbon panel of judges on October 7, where category and Grand Award winners were selected. This year's **Body Exterior** category winner was also voted the **Grand Award** winner. Other winners were as follows. Details on all of this year's nominations will be found at <http://speautomotive.com/Awards%20Modules/2013Awards/Home.html>.

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GRAND AWARD & CATEGORY WINNER: Body Exterior

• ALL-OLEFINIC LIFTGATE

- **OEM Make & Model:** 2014 Nissan Motor Co. Nissan* Rogue* cross-over utility vehicle (CUV)
- **Tier Supplier/Processor:** Hitachi Chemical / Magna-Decostar
- **Material Supplier / Toolmaker:** LyondellBasell & Advanced Composites, Inc. / Kyowa Industrial Co., Ltd.
- **Material / Process:** Hifax* TYC 1175P thermoplastic polyolefin (TPO, outer panel) & Mostran* L5091-P long-fiber thermoplastic polypropylene (LFT-PP, inner panel) / Injection molding
- **Description:** This liftgate is unique in that all materials are fully olefinic (hence, fully recyclable at end of vehicle life) and it features North America's first TPO outer panel. The full assembly sports unique styling and is 30% lighter than comparable stamped steel systems, improving fuel efficiency by 10%. Lower weight also reduces carbon dioxide (CO₂) emissions and facilitates customer opening/closing of the lighter liftgate. Thanks to parts integration, low scrap, and reuse of offal possible with injection-molded thermoplastics, raw-material costs on the outer panel were reduced 35% vs sheet-molding compound (SMC). Use of a high-flow, high-stiffness, high-impact TPO formulation reduced molding cycles vs. SMC and traditional TPO compounds for the painted Class A outer panel. Use of molded-in-color (MIC) LFT-PP met mechanical requirements and eliminated paint on the Class A inner panel, reducing VOC emissions. Both panels were joined via a structural adhesive for which they were formulated to have an affinity.

CATEGORY WINNER: Body Interior

• THINWALL INSTRUMENT PANEL RETAINER

- **OEM Make & Model:** 2014 Chrysler Group LLC Jeep* Cherokee* sport-utility vehicle (SUV)
- **Tier Supplier/Processor:** Intertec Systems
- **Material Supplier / Toolmaker:** SABIC / Windsor Mold Group
- **Material / Process:** Stamax* 30YK270 PP / Thinwall injection molding
- **Description:** This application represents North America's first instrument-panel (IP) retainer molded at 2.0-mm walls in LFT-PP composite. Typical wallstock on conventional injection-molded olefin resin is 2.5-4.0 mm, meaning parts are heavier and have longer molding cycles. The 30% glass-reinforced (GR) LFT-PP resin provides required stiffness, strength, and impact performance to meet interior safety requirements at a great value. Thinwall molding helped reduce cycle times 30%, part weight 27%, and costs \$3 USD/vehicle, contributing to better vehicle weight, fuel efficiency, and U.S. Corporate Average Fuel Economy (CAFE) targets. It also helped reduce plastics consumption by 2.5-million lb over the life of the program. Advanced fiber-orientation modeling was used to reduce warpage during mold design.

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CATEGORY WINNER: Chassis/Hardware

• BUMPER ENERGY ABSORBER

- **OEM Make & Model:** 2013 Ford Motor Co. Ford* Fusion* & Mondeo* sedans
- **Tier Supplier/Processor:** Magna Exteriors & Interiors
- **Material Supplier / Toolmaker:** SABIC / not stated
- **Material / Process:** Xenoy* 1103 polycarbonate (PC)/polybutylene terephthalate (PBT) / Injection molding
- **Description:** Globally, this is the first single-piece front bumper energy absorber (EA) that simultaneously meets the conflicting requirements of both Part 581 bumper damageability (which tends to require a stiff EA) and Pedestrian Protection GTR lower-leg impact (which tends to require a soft EA). By developing a common EA that meets both sets of requirements and is tunable, the need for different EAs, bumper beams, and bumper fascias in different geographies with different impact requirements is eliminated. The injection molded PC/PBT blend offers excellent energy absorption properties during deformation (up to 100% strain) while retaining its structural integrity from -30 to 60C. The patent-pending system reduces complexity in design, manufacturing, and assembly, plus improves pedestrian safety while lowering replacement costs during low-speed impacts. It is 40% lighter and 10% less expensive than steel EAs, and 20% lighter than thicker PP EAs at comparable costs.

CATEGORY WINNER: Electrical Systems (*new category for 2013*)

• ELECTRIC VEHICLE-BATTERY ENCLOSURE

- **OEM Make & Model:** 2014 General Motors Co. Chevrolet*Spark* electric vehicle (EV)
- **Tier Supplier/Processor:** A123 Systems, LLC / Continental Structural Plastics
- **Material Supplier / Toolmaker:** Cytec Industries Inc. / Century Tool & Gage
- **Material / Process:** Vinyl ester / Compression molding
- **Description:** This composite EV battery enclosure was required to meet a number of severe performance requirements, including 30° offset-barrier, side-impact, and rear-barrier crash; 50 G impulse shock (X, Y, Z); post-crash package integrity; fire-resistance testing; 3-m drop testing (bottom/end); 1-m water-submersion test; and vibration/shock testing. To satisfy all criteria, new material, production process, post-mold finishing, and non-destructive test methods were needed. The result is industry's first application of a volatile-organic compound (VOC)-free thermoset vinyl ester resin reinforced with a coarse basket-weave glass rove cloth to form a complex-shaped enclosure that protects the EV's battery components in the event of a catastrophic event. The tough compression-molded composite is 40% lighter than metallic solutions, helping the vehicle achieve extended range and enhanced performance. Since it is non-conductive, it protects occupants and first responders to an accident scene. Specially formulated resin is free of styrene emissions, making it safer for workers and the environment. Selective pattern layouts allow for localized reinforcement. The application also features a large structural joint of composite to steel.

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CATEGORY WINNER: Materials

• INSTRUMENT PANEL WITH INJECTION-MOLDED SKIN

- **OEM Make & Model:** 2013 Nissan Motor Co. Nissan* Sentra* compact car
- **Tier Supplier/Processor:** Calsonic Kansei Corp.
- **Material Supplier / Toolmaker:** Asahi Kasei Chemicals / Calsonic Kansei Corp.
- **Material / Process:** Sunvicio* A7171 thermoplastic vulcanizate (TPV) / Injection molding
- **Description:** This is the world's first instrument panel featuring an injection-molded thinwall skin in ultrahigh-flow TPV. With a melt-flow rate of 250 g/10 min and excellent mechanical properties, this specially formulated material made it possible to mold a 1-mm skin that could accommodate the IP's deep draws and uneven undercuts without tearing, thereby providing new levels of design and styling options. The TPV also provides superior visual appeal, distinctive elongation, and softer touch desired by consumers without compromising proper airbag deployment and function. Compared with polyvinyl chloride (PVC) slush molding, it offers good long-term appearance and gloss levels. Molded in a 60-sec cycle, the new skin material is 25% lighter and 10% less costly than PVC slush molding and also reduced tooling costs, plus scrap is reusable. Additionally, there also was a 58% CO₂ savings vs. PVC slush molding since the process is less energy intensive. The skin's good mold-release characteristics help minimize the need for mold-release spray, reducing volatiles further.

CATEGORY WINNER: Powertrain

• TURBOCHARGED AIR DUCT

- **OEM Make & Model:** 2011 Audi AG Audi A4* & A5* sedans with 2.0L TDI & TFSI engines
- **Tier Supplier/Processor:** Röchling Automotive
- **Material Supplier / Toolmaker:** ZEON Corp. / Röchling Automotive
- **Material / Process:** Polyamide (PA, also called nylon) 6 + alkyl acrylate copolymer (ACM, also called acrylic rubber) / Suction blow molding
- **Description:** This application combines the air-intake duct with charge air cooler and integrates both into the intake manifold, reducing air-intake loop volume by up to 50% (for better engine response) while also lowering package space 40% and part count, weight, and costs by 20%. The resulting system reduces pressure losses so turbine work is reduced while keeping the same boost pressure at air-intake valves and helping reduce pumping work in the turbocharger 10% at high engine loads. Novel production technology (suction blow molding) and a new high-performance soft TPV (PA 6 + ACM), which can withstand 2.7 bars of overpressure at 125C were used. There was no need to design in bellows on this part, since the material was able to decouple engine movements from the intercooler by itself, and no internal protection layer was needed to shield the material from exposure to acidic blow-by fluids. Unlike conventional rubber, the part is fully recyclable at end of life. This led to 50% direct and 50% indirect cost savings. Thanks to acoustic improvements, interior cabin noise also is reduced for occupants.

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CATEGORY WINNER: Process/Assembly/Enabling Technologies

• PRESSURE PRESS TECHNOLOGY

- **OEM Make & Model:** 2014 General Motors Co. Corvette* Stingray*sports car
- **Tier Supplier/Processor:** Globe Machine Manufacturing Co. / Plasan Carbon Composites
- **Material Supplier / Toolmaker:** Toray North America / Weber Manufacturing Technologies Inc.
- **Material / Process:** Epoxy carbon fiber prepreg / New out-of-autoclave molding process
- **Description:** This is the first production use of a new rapid out-of-autoclave production process for carbon fiber-reinforced composites. It produces parts with equivalent mechanical properties and better aesthetics far faster than the traditional autoclave (in 17 vs. 150 min). This significantly reduces costs and makes carbon composites practical and affordable for the first time for medium-volume automotive production. Key to this significant technology breakthrough was R&D characterization of the autoclave cure cycle and resin cure kinetics, which led to several patent filings, a 66% reduction in cycle time, a 30% reduction in direct part costs, and a 75% reduction in the cost of process consumables. Additionally, the specially designed process and equipment prevents the traditional exothermic cure reaction, eliminating the need for nitrogen blanketing and release of volatiles. Nickel-vapor-deposition (NVD) tooling with embedded hot-oil heating/cooling lines moves heat quickly through the Z-axis for rapid curing. A reusable silicone rubber canopy (good for 400-500 parts) reduces the cost and hassle of traditional disposable bagging. Parts exit the tool with more consistent surfaces, reducing finishing operations by 35%.

CATEGORY WINNER: Safety

• SIDE AIRBAG COVER

- **OEM Make & Model:** 2013 Ford Motor Co. Ford*Fusion* mid-size sedan
- **Tier Supplier/Processor:** Autoliv Inc. / Atlantic Precision Products
- **Material Supplier / Toolmaker:** Mitsubishi / Great Lakes Mold & Engineering
- **Material / Process:** TT914 CNP TPO / Injection molding
- **Description:** Replacing a conventional metal can and plastic cover, this is the first time that an insert-molded bracket/cover assembly has been designed to be both the mounting surface for the seat side airbag (SAB) as well as integral to the performance and cosmetic function of the cover. This unique design answered the challenge of meeting styling studio requests for a thin seat appearance, but providing packaging space for increasingly large side airbags, which now typically protect occupants from chest to pelvis. The insert-molded cantilevered metal bracket allows for efficient assembly at the airbag supplier, reducing part counts typically required for a Class A side airbag module and saving 300 g of weight. Extensive filling and tooling development was used to ensure proper bracket encapsulation by the tough TPO resin, which maintains a Class A appearance during normal usage, but delivers proper airbag deployment in a side impact event. The design also virtually eliminates craftsmanship fit concerns that can be an issue with conventional "can & cover" SAB designs.

SPE Announces Category, Grand Award Winners of 43rd Auto Innovation Awards Competition
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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.

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 for 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, see <http://speautomotive.com/inno> and <http://speautomotive.com/awa>.

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TROY, (DETROIT) MICH. – The *Body Exterior Category and Grand Award* winner of the 2013 **SPE® Automotive Innovation Awards Competition** is the *All Olefenic Liftgate* on the 2014 model year (MY) Nissan* Rogue* cross-over utility vehicle (CUV) by Nissan Motor Co. The winner was announced tonight at the 43rd-annual **SPE® Automotive Innovation Awards Gala** held at Burton Manor in the Detroit suburbs. Tier supplier, Hitachi Automotive Systems, Ltd.; processor, Magna-Decostar; materials suppliers, LyondellBasell and Advanced Composites, Inc.; and toolmaker, Kyowa Industrial Co., Ltd. were also named on the award. For more information, see <http://speautomotive.com/inno> and <http://speautomotive.com/awa> .

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TROY, (DETROIT) MICH. – The **Body Interior Category** winner of the 2013 **SPE® Automotive Innovation Awards Competition** is the *Thinwall Instrument Panel Retainer* on the 2014 model year (MY) Jeep* Cherokee*sport-utility vehicle (SUV) by Chrysler Group LLC. The winner was announced tonight at the 43rd-annual **SPE® Automotive Innovation Awards Gala** held at Burton Manor in the Detroit suburbs. Tier supplier and processor, Intertec Systems; materials supplier, SABIC; and toolmaker, Windsor Mold Group were also named on the award. For more information, see <http://speautomotive.com/inno> and <http://speautomotive.com/awa> .

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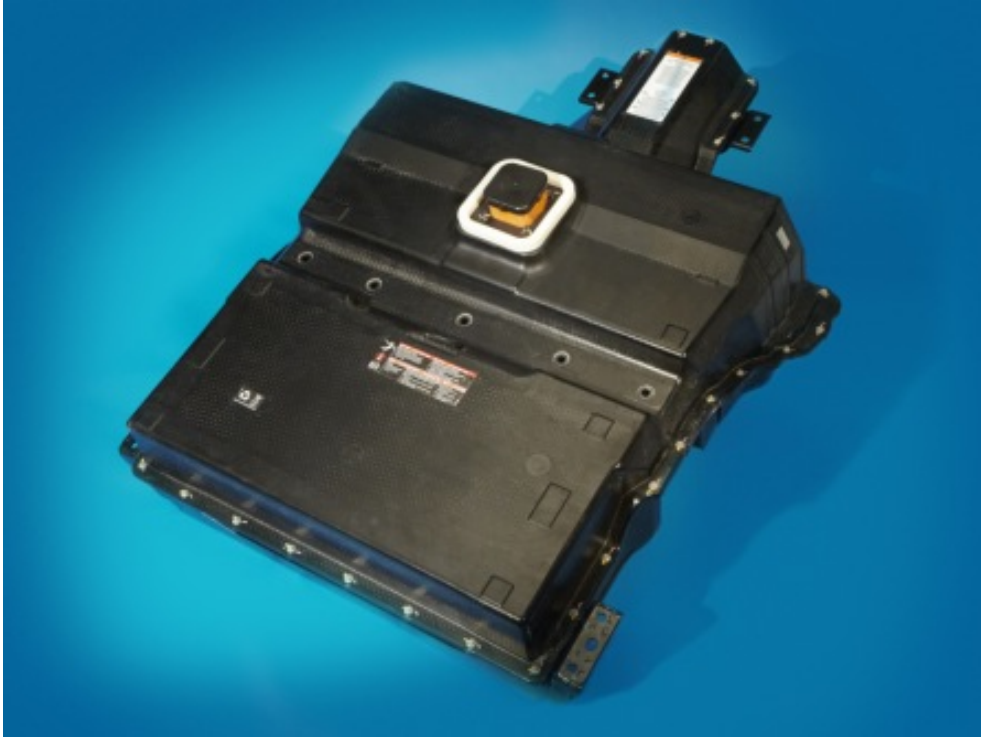
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TROY, (DETROIT) MICH. – The *Electrical Systems Category* winner of the 2013 **SPE[®] Automotive Innovation Awards Competition** is the *Electric Vehicle Battery Enclosure* on the 2014 model year (MY) Chevrolet* Spark* electric vehicle by General Motors Co. The winner was announced tonight at the 43rd-annual **SPE[®] Automotive Innovation Awards Gala** held at Burton Manor in the Detroit suburbs. Tier supplier, A123 Systems, LLC; processor, Continental Structural Plastics; materials supplier, Cytec Industries Inc.; and toolmaker, Century Tool & Gage were also named on the award. Electrical Systems was a new category added to the competition in 2013 owing to the significant increase in nominations over the past four years for battery- and hybrid-electric vehicles and lighting technologies. For more information, see <http://speautomotive.com/inno> and <http://speautomotive.com/awa> .

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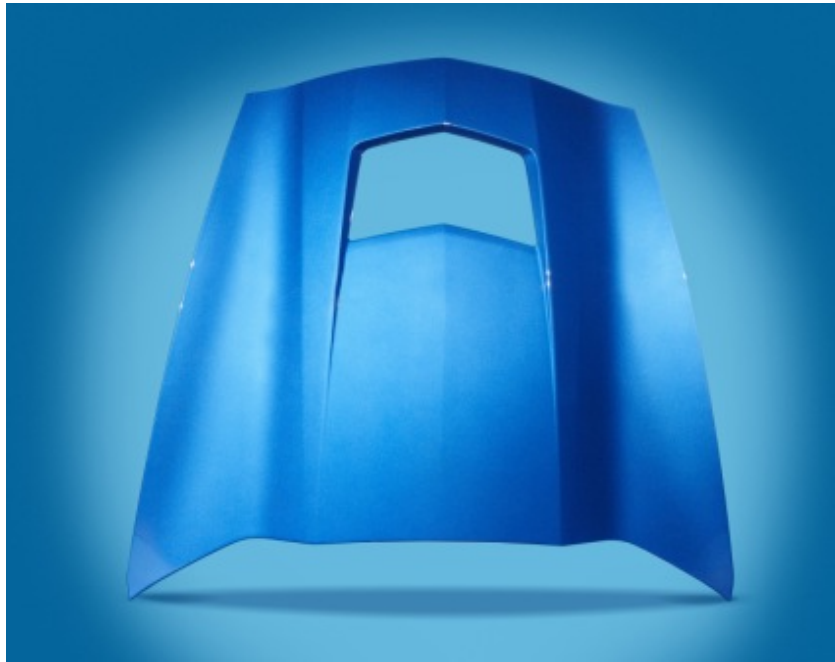
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