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SPE® AUTOMOTIVE DIVISION ANNOUNCES FINALISTS FOR *AUTOMOTIVE INNOVATION AWARDS COMPETITION*

TROY, (DETROIT) MICH. – After two days of difficult judging, the planning committee for the 36th-annual SPE® *Automotive Innovation Awards Competition & Gala* has announced category finalists for this year's competition.

This year's ***Body Exterior*** category had a large number of nominations – all of which were quite good. Five applications in this category are advancing to the next round of competition:

BLOW-MOLDED FRONT & REAR BUMPER SYSTEM – '07 MY DaimlerChrysler Jeep® JK SUV –
Description: This blow-molded, all-plastic bumper replaced a traditional steel application and offered a 12% piece-cost and assembly-cost reduction as well as a 9% weight reduction. Furthermore, the design meets domestic impact performance and European safety requirement while complying with OEM styling objectives. Contributing team:

- System Supplier: ABC Group Inc.
- Material Processor: ABC Group Inc.
- Material Supplier: Salflex Polymers (ABC Group)
- Resin: Salflex® 610 MW - RXF TPO
- Tooling Supplier: Supreme Tooling (ABC Group)

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FRONT GRILLE – '06 MY DaimlerChrysler Jeep® Grand Cherokee / Commander SUV – Description:
This new design and molding significantly reduces the complexity of grille-opening reinforcement (GOR) systems via use of a unique slide-fastening design, which eliminates traditional snap attachments and post-molding operations. The resulting parts consolidation and weight reduction provided a significant cost reduction per vehicle. Improved servicability and ease of assembly were also achieved.

System Supplier: Guardian Automotive
Material Processor: Guardian Automotive
Material Supplier: BASF Corporation
Resin: Luran® S 777K ASA
Tooling Supplier: Braidco

INTEGRATED PARK & TURN LAMP ASSEMBLY – '07 MY DaimlerChrysler Jeep® Compass SUV – Description:
Integration of the park and turn lamp assembly into the TPO front fascia module not only provided a unique styling effect, but also enabled a significant mass savings (1 kg) and cost reduction (\$3.50 USD / vehicle). This is the first integrated park and turn lamp assembly mounted into a TPO front fascia module that utilizes a self locating T-rib design.

System Supplier: Collins & Aikman
Material Processor: Collins & Aikman
Material Supplier: ExxonMobil
Resin: Exxon 8224-E2 TPO
Tooling Supplier: Collins & Aikman

TRUCK BUMPER END CAP – '07 MY Freightliner® L.L.C. Columbia® heavy truck – Description:
Through the use of a paint-film lamination, Hendrickson's AERO BRIGHT® (HAB®) end cap provides a chrome appearance without the expense and environmental issues of electroplating. Mass and cost reductions were achieved by using the mirror-finish film, which is laminated to the TPO sheet prior to being thermoformed into the final part geometry. The bright, all-plastic end cap can be replaced without changing the entire bumper assembly if damage occurs.

System Supplier: Hendrickson Bumper & Trim
Material Processor: Profile Plastics Corporation
Material Supplier: Solvay Engineered Polymers, Inc. (TPO), and Soliant (paint film)
Resin: SEQUEL® E3000 TPO
Tooling Supplier: Portage Casting & Mold, Inc.

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REMOVABLE HARD TOP WITH "FREEDOM PANELS" – '07 MY DaimlerChrysler Jeep® Wrangler SUV –

Description: "Freedom Top" SMC panels provide 8 unique design and styling configurations for this composite roof module. All main panels achieve a Class-A finish on the interior via molded-in-color, as well as Class-A finish on the exterior via spatter coating. Structure is derived from bonded inner "picture frames" that also house all necessary latching hardware and seals. The molded roof panels achieved a significant cost and mass savings vs. traditional metal roof structures while offering more configurations for use.

System Supplier: Meridian Automotive Systems
Material Processor: Meridian Automotive Systems
Material Supplier: Meridian Automotive Systems
Resin: SMC
Tooling Supplier: Century Tool

Four applications in the **Body Interior** category will now advance to the next round of competition:

BLOW-MOLDED LOAD FLOOR WITH INTEGRAL NON-SLIP SURFACE – '06 MY DaimlerChrysler Dodge® Caliber®, Jeep® Compass® & Patriot® vehicles –

Description: This load floor incorporates a non-slip textured surface (TPO) that is insert blow-molded into parts as the load floor is formed, without additional fabrication steps. The non-carpeted non-slip flooring surface is both very functional and attractive and can easily be washed if soiled. The load floor is available in multiple colors and patterns to add accent and style to the vehicle's interior.

System Supplier: Lear Corporation
Material Processor: Lear-Fremont, OH
Material Supplier: Spartech Polycom
Resin: Spartech EP6713 B1 & Lear "Ultrafloor" LF:13% talc PP; UF:TPO
Tooling Supplier: Fremont Plastic Mold

IP WITH RIM SKIN OVER TPO SUBSTRATE & SEAMLESS PASSENGER AIRBAG – '07 MY Ford Motor Company Lincoln® MKX passenger car –

Description: This instrument panel (IP) skin uses a 2-component, aliphatic polyurethane (PUR) elastomer modified for the RIM molding process in a closed cavity process. This results in reduced cycle time and lower tooling investment. Skin-thickness control, low-temperature ductility, and tear properties of the polyurethane RIM skin are key enablers for integration of the seamless passenger airbag. The estimated savings vs. alternative technologies is \$15 USD / vehicle.

System Supplier: Intertec Systems
Material Processor: Intertec Systems
Material Supplier: Intertec Systems (PUR) and Basell Polyolefins (TPO)
Resin: not available / Hostacom® TPO Hostacom TRC727N PUR/TPO
Tooling Supplier: EPW

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LONG-GLASS FIBER INJECTION-MOLDED POLYPROPYLENE IP – '06 MY DaimlerChrysler Mercedes® M Class / R Class / GL Class passenger vehicles – Description: This is the first application of long-glass fiber polypropylene (PP) in a large injection-molded instrument panel retainer. This part has thin wallstock (1.8 mm), and the process utilized sequential valve gating and a special injection-mold screw design to aid processing. A weight reduction of 20% was achieved, and savings of \$200,000 USD were realized.

System Supplier: Delphi Corporation
Material Processor: Delphi Corporation
Material Supplier: StaMax
Resin: StaMax® GF-PP
Tooling Supplier: not available

IN-LINE COMPOUNDED STRUCTURAL DUCT ASSEMBLY – '07 MY DaimlerChrysler Dodge® Nitro® SUV – Description: This is the first application of in-line compounding / injection molding for a 2-piece, vibration-welded instrument panel structural-duct assembly. The TPO IP retainer (base panel) is subsequently welded to the structural duct, which has a Class-A finish. Overall assembly cost savings due to materials used (PP vs. PC/ABS) is approximately 15%.

System Supplier: Intertec Systems
Material Processor: Intertec Systems
Material Supplier: Basell Polyolefins
Resin: Pro-fax® SG853 PP
Tooling Supplier: Phillips Tool & Mould Limited

The *Chassis / Hardware* category will send four applications forward to the next round of competition:

THERMOPLASTIC DOOR HARDWARE MODULE & CARRIER – '07 MY DaimlerChrysler Chrysler® Sebring sedan – Description: This single-piece door hardware module and structural reinforcement uses long-fiber technology to reduce weight and provide structural, acoustical, and safety door functions. Part reduction is achieved through integration of the window regulator, latch, audio, interior panel, electrical, and electronics systems components. Mass savings of over 0.9 kg (2 lb) / vehicle were realized, along with 50% reduction in assembly costs, and 10% reductions in materials costs.

System Supplier: Magna Closures
Material Processor: Intier Automotive Interiors
Material Supplier: Intier Automotive Interiors
Resin: not available / not available
Tooling Supplier: Micro Mold

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RAIL-LESS WINDOW REGULATOR – '07 MY DaimlerChrysler Dodge® Nitro® SUV – Description: This is the first integrated, cable-driven, rail-less window regulator system for door modules. The innovative carrier integrates the drum housing and utilizes an industry-first, robotically extruded thermoplastic seal to form the separation between wet and dry sides. The application achieved a weight savings of 25% and a direct cost savings of \$7 USD / vehicle.

System Supplier: Faurecia Interior Systems
Material Processor: Faurecia Interior Systems
Material Supplier: St. Gobain / ExxonMobil
Resin: Twintex® GF PP
Tooling Supplier: Omega

ALL-PLASTIC STRUCTURAL WINDOW FRAME – '07 MY DaimlerChrysler Jeep® Wrangler SUV – Description: The first-ever structural window frame that is visible from the exterior and the interior of the vehicle is achieved by ultrasonically welding fabric to the window frame & insert molding metal support arms. "Lightweighting" the door enables easy consumer removal for a full vehicle open-air experience. Over 4% weight savings and 8% cost savings were realized.

System Supplier: Decoma / Bestop
Material Processor: Nyloncraft
Material Supplier: Ticona Engineering Polymers
Resin: Celstran® PP-GF40-10 GF PP
Tooling Supplier: Briadco Tool and Mold

BODY-ON-FRAME FRONT-END CARRIER – '07 MY DaimlerChrysler Jeep® Wrangler SUV – Description: This application represents the first use of reinforced plastic as a structural load member for a body-on-frame assembly. Use of low-energy adhesive, long-glass-fiber-reinforced polypropylene, and steel tubes allowed joint stiffnesses to be maintained while improving durability performance. The final design provided a 15% systems weight saving and a 25% cost saving replacing vs. the all-steel welded system it replaced.

System Supplier: Decoma TEAM Systems
Material Processor: Decoma TEAM Systems
Material Supplier: Ticona Engineering Polymers
Resin: Celstran® PP-GF40-03 GF PP
Tooling Supplier: TMD (Toledo Mould)

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The **Environmental** category is sending two applications forward to the Blue-Ribbon round of judging:

FIBERGLASS-FREE HEADLINER – '07 MY Honda® Acura® MDX – Description: This application uses a non-glass fiber reinforcement, which enables complete disposal (incineration) of the headliner by the OEM vehicle recycler. Incinerating fiberglass headliners causes huge disposal issues, especially in Japan and Europe. The basalt-reinforced PP composite meets the OEM's disposal requirements without incinerator contamination issues.

System Supplier: not available
Material Processor: not available
Material Supplier: Azdel, Inc.
Resin: VolcaLite™ basalt-reinforced PP composite
Tooling Supplier: not available

SNAP-IN LIFT PLATE ON DOOR GLASS ASSEMBLIES – '07 MY DaimlerChrysler Jeep® SUVs (KA and KK), Chrysler® Sebring® sedan, Dodge® Stratus® sedan, Compass® cross-over SUV, and Caliber® compact car – Description: This application's door glass lift plates result in improved environmental performance due to the elimination of adhesive and curing processes; improved recyclability; and 1,000 fewer trailer-truck shipments / year. The positive snap closure brought significant improvement in installation first-time capability, reliability, serviceability, and quality, as well as speed of installation / service.

System Supplier: Grupo Antolin/Magna Closures/Arvin Meritor
Material Processor: Nypro
Material Supplier: Ticona Engineering Polymers
Resin: Hostaform® C9021 PMMA
Tooling Supplier: Unique-Skill Precision Pte Ltd, Singapore

In the **Materials** category, two nominations will advance to Blue-Ribbon judging:

INTERIOR OVERHEAD CONSOLE – '07 MY General Motors Opel® Zafira® Tracker minivan – Description: Low gloss and a scratch-resistant matte finish are achieved without the use of paint this 1.8-meter (5.9-ft) long, 8-compartment overhead console molded using a unique ABS / nylon blend. Acoustic properties of the material allow for increased damping behavior vs. PC / ABS, ABS, or PP resins, significantly improving NVH. Cost savings of 40% were achieved through elimination of metal structures.

System Supplier: REUM Group
Material Processor: REUM Group
Material Supplier: BASF
Resin: BASF TERBLEND® N NG-02 (8% GF), and NG-04(20% GF) ABS+PA6
Tooling Supplier: not available

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THERMOPLASTIC VULCANIZATE PRIMARY SEAL – '07 MY DaimlerChrysler DR Ram® pickup –
Description: This application is the first TPV body-mounted primary seal used in a complete dynamic-sealing application. The new JyFlex material is an EPDM-sponge-equivalent material that enables the transition from rubber to thermoplastic. Estimated cost savings of 20% (\$5 / vehicle) were achieved.

System Supplier: JYCO
Material Processor: JYCO
Material Supplier: JyFlex
Resin: TPV
Tooling Supplier: JYCO

For the **Performance & Customization** category, which captures aftermarket innovations and was added to the competition two years ago, two applications advance to the finals:

THERMOFORMED CUSTOM SEATING – Any MY Various Pickup Trucks – Description: This thermoformed custom seating for two with integral cup holders provides convenient seating 2 on the tailgate of pickup trucks. The seat surface is textured and the base model features molded-in black color. Other custom colors and finishes, such as *Camouflage* and *Real Tree*, are also available. The product provides weight savings of 20% and cost savings of 50% vs. other systems.

System Supplier: Talegator Distributors LLC
Material Processor: Advanced Engineering Company
Material Supplier: Primex Plastics
Resin: Lustran® 752, Virgin cap utility core ABS
Tooling Supplier: Millennium Mold and Tool

FLUSH REAR CENTER SLIDING WINDOW ASSEMBLY – '07 MY General Motors GMT800® pickups –
Description: The flush rear center sliding window assembly provides a pleasing aesthetic appearance for pickups due to a flush-mounted concealed window opening. A patent-pending molded bulb seal provides a leak-resistant barrier and an excellent leak-proof water management system. This development can be applied to other OEM pickups.

System Supplier: Guardian Automotive Products
Material Processor: Guardian Automotive
Material Supplier: DuPont Automotive
Resin: Rynite® 530 BK503 PET
Tooling Supplier: not available

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These three applications in the **Powertrain** category are now headed for the second round of judging:

2.7-LITER THERMOSTAT WATER INLET ASSEMBLY – '07 MY DaimlerChrysler 2.7-liter Engine –

Description: Radiator and heater hoses on the '07 MY DaimlerChrysler 2.7-L engine are molded without parting lines, thus eliminating leaks at the interface and reducing warranty costs. Through innovative taper design, modification of process, and tooling, the hose are molded using a severe undercut ratios >10% using a glass-filled polyphthalamide (PPA) resin that has only 2% elongation.

System Supplier: Cooper Standard Automotive

Material Processor: Mathson Industries, Inc.

Material Supplier: EMS-Grivory

Resin: Grivory HTV-3h1 PPA Glass Filled

Tooling Supplier: Mathson Industries, Inc.

COMBINED WIDEBAND TURBO RESONATOR – '07 MY DaimlerChrysler Jeep® KA / KK SUVs –

Description: Turbo whine as well as blade-pass noise is no longer audible on vehicle interior or exterior due to this first-ever combination resonator mounted on the pressure side of the turbocharger. The in-line mounted, single-housing resonator provides wideband frequency attenuation. The combination of position and attenuation level saves about 60% in mass and materials vs. alternate methods of quieting turbocharged vehicles.

System Supplier: Woco MAS USA Inc.

Material Processor: Novoplas

Material Supplier: DuPont Automotive

Resin: Zytel® 70G33 PA 6.6 GF 33

Tooling Supplier: Novoplas

COMPOSITE VALVE-COVER ASSEMBLY WITH OIL TRAP– '07 MY Volvo Powertrain Mack® Vision®, Granite®, and MR® trucks –

Description: This first metallic top-coated SMC valve-cover assembly with deep draw and die-locked features meets all requirements for Volvo Powertrain – North America. Use of SMC allowed for significantly reduced investment, with 30% mass saving and 50% piece-cost savings vs. a cast-aluminum design.

System Supplier: Meridian Automotive Systems

Material Processor: Meridian Automotive Systems

Material Supplier: Meridian Automotive Systems

Resin: SMC

Tooling Supplier: Concours Mold

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In the *Process / Assembly / Enabling Technologies* category, four nominations will advance to the Blue-Ribbon judging:

SPOILER ASSEMBLY WITH INTEGRATED GREEN-HOUSE TRIM – '06 MY DaimlerChrysler Dodge® Caliber® compact car– Description: This is the first application utilizing TPO / TPE 2-shot injection molding with vertical cubic rotation to produce a spoiler assembly integrated with upper green-house trim. The structural base of the spoiler is friction welded. An estimated 10% weight savings and approximately 40% / vehicle piece-cost savings was achieved.

System Supplier: Scherer Trier USA
Material Processor: Scherer Trier USA
Material Supplier: Basell Polyolifins
Resin: HiFax® BR 1149 PC 'RFX' Black TPO
Tooling Supplier: Hoffman Tool (Germany)

FREEFORM (2-SHOT) DOOR BOLSTER – '07 MY DaimlerChrysler Dodge® Caliber® compact car – Description: This process combines a structural substrate and a soft-feel outer surface in a single high-pressure molding operation. Creative surface designs that can intermix different colors, haptics, thicknesses, and textures are used to produce a single, more-cost-effective part while also providing the perception of a more expensive component. Cost savings of 10 - 20%, and weight savings of 15%, were realized.

System Supplier: Lear Corporation
Material Processor: Lear Corporation - Greencastle
Material Supplier: Kraiburg
Resin: Thermolast K® HTP8679/33 PP + TPE-S (SEBS)
Tooling Supplier: Hi-Tech

IN-MOLD COMPOUNDING – SLUSH PROCESS – '07 MY BMW® E63 M® Version – Description: This is the first IMC-Slush process for instrument-panel skins. The process allows surface properties of a slush-molded skin to be decoupled from the substrate properties. By optimizing the surface and the substrate independently, conflicting customer requirements can be met. Cost savings of 30% were realized through the use of a lower cost aromatic TPU grade.

System Supplier: Intier Automotive Eybl Interiors GmbH
Material Processor: Intier Automotive Eybl Interiors GmbH
Material Supplier: Bayer MaterialScience
Resin: Desmopan® 3790 AP TPU
Tooling Supplier: Galvanoform

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INTEGRATED SNAP ATTACHMENT & SPLIT-TONGUE & GROOVE SEAL – '07 MY General Motors Cadillac®, Chevrolet®, and GMC® vehicles – Description: The combination of snap design and split-tongue & groove case-to-case seal creates a simple, snap-together HVAC module. The unit's assembly was automated using an innovative workstation that performs the assembly with verification of engagement of each of the snap features. A 5% module cost reduction was achieved via the elimination of screws and the associated labor.

System Supplier: Delphi Automotive
Material Processor: Delphi Thermal
Material Supplier: Spartech-Polycom
Resin: TF PP
Tooling Supplier: Asis Co., Ltd.

SPE's newest category – **Safety**, added last year – will send three finalists to the second round of judging:

POWER LIFTGATE ANTI-PINCH SENSORS – '07 MY Nissan Quest® SUV & Armada® cross-over vehicle – Description: A conductive grade of thermoplastic vulcanizate (TPV) is used for the first time in power liftgate anti-pinch sensors. The co-extruded TPV material, with a wire core inner, replaced thermoset EPDM rubber, which tends to harden over time as well as exhibit surface blooming, chalking, and cracking. The TPV solution offers superior long-term surface aesthetics while meeting flexibility and performance requirements.

System Supplier: Nicholas Plastics, Inc.
Material Processor: Nicholas Plastics, Inc.
Material Supplier: AES
Resin: Santoprene 121-50 Olefinic TPV
Tooling Supplier: Nicholas Plastics, Inc.

PEDESTRIAN-PROTECTION LOWER BUMPER STIFFENER – '07 MY General Motors Opel® Corsa® minicar – Description: The lower bumper stiffener, a component incorporated in the front-end, allows the Corsa to comply with recently enacted, European Union pedestrian-protection regulations. This part was modeled via computer-aided engineering, taking into consideration the non-linear anisotropic behavior of its long-glass nylon 6 material. As a result, structural performance was more accurately predicted, decreasing the rate of acceleration of the lower leg during a pedestrian impact.

System Supplier: not available
Material Processor: not available
Material Supplier: BASF
Resin: BASF ULTRAMID® B3WG6 CR PA6
Tooling Supplier: not available

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FULLY STRUCTURAL BLOW-MOLDED SEATBACKS – '07 MY Audi AG TT sportscar – Description:
These all-plastic, blow-molded PC/ABS seatbacks meet strict European safety legislation, including ECE 17 luggage retention, as well as other globally mandated requirements. Because the PC/ABS blow-molded seatbacks replaced metal, a significant weight savings of almost 2.3 kg (5 lb) / vehicle was realized as well as a cost savings of \$4 USD / vehicle.

System Supplier: Lear Corporation
Material Processor: Moellertech GmbH
Material Supplier: Dow Automotive
Resin: PULSE™ engineering resins 2200 BG PC/ABS
Tooling Supplier: not available

Teams representing each of these applications will advance to the next round of judging before the Blue Ribbon panel on **October 18** at the Auburn Hills, Mich. offices of Ticona Engineering Polymers. There, a winner in each category will be chosen, along with the **Hall of Fame** and **Grand Award** winner – the most prestigious award of the entire event. Winning teams will be fêted at the **Automotive Innovation Awards Gala** on **November 13, 2006** at Burton Manor in Livonia, Mich.

SPE's *Innovation Awards Gala* is the 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 module and why it merits the claim as *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 will be used to support SPE educational efforts and technical seminars, which will help to secure the role of plastics in the advancement of the automobile.

The mission of SPE International 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 about the *SPE Innovation Awards Gala*, visit the SPE Automotive Division's website at www.speautomotive.com, or contact the group at +1.248.244.8993, or write SPE Automotive Division, 1800 Crooks Road, Suite A, Troy, MI 48084, USA.

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