

PolymerPlace Notes

A plastics technology newsletter

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What's New At Polymerplace?

We presented a paper at ANTEC, the annual technical meeting of the Society of Plastics Engineers, on Product Design Advances Through Plastics in early May. The presentation is available on the Polymerplace site. www.polymerplace.com In addition to the Product Design Advances Through Plastics presentation, we also have the annual Plastics World Markets presentation by Bill Kuhlke available on the site.

We attended the Automotive Interiors Show in Detroit May 14-16. Some highlights of the two shows will be included in the newsletter this month.

We want to take this opportunity to tell you that we offer market research through the Polymerplace site as well as in-depth market research through our partners, G.H.Associates and Franklin International. If you want to understand the needs in your market for product improvements, new technology or need a boost to your business development, we would like to help you! For more information please e-mail us at info@polymerplace.com or info@gh-associates.com

Feature Story

At the SAE show this past March, a whole exhibition area was dedicated to Telematics. [What is Telematics?](#) Telematics is a term that includes entertainment, navigation, emergency services and environmental condition systems in the vehicle.

News from the Auto Interiors show and the Automotive News Europe Telematics conference in Germany last month would indicate that the hope for huge profits from Telematics has not materialized.

Automakers are still searching for applications that will attract customers. And who will control telematics in cars- the telecommunication companies or the automakers.

Recently Volkswagen conducted a survey of potential new car buyers to determine their preference in telematics products. The top choice was navigation followed by traffic information, emergency services, weather and news and entertainment.

In Europe, only 50,000 vehicles equipped with telematics are on the road, compared with more than 3 million in the United States. Most companies in the telematics supply chain are losing money.

Thus many industry experts now feel that the promise of telematics as a profitable addition to the automotive product offering is still a ways off.

Polymer Markets

Transportation

TI Automotive Ltd. is launching production of two new blow molded fuel tank systems designed to capture emissions.

The systems — one is called a Ship in a Bottle(SIB), the other the Complete Vapor Recovery (CVR). TI Automotive will spend 6.5 million euros (\$5.8 million) to install a blow molding line in Germany. “The new system will enable us to shorten the product development process,” Manouchehr Kambakhsh, vice president for global advanced engineering, said in a recent press release.

Both the ship in a bottle — or SIB system — and the CVR are designed to reduce emissions from existing multilayer plastic fuel tanks and meet increasingly tougher control demands from the state of California.

The SIB moves some components inside the tank to capture vapors that otherwise could leak out at connection sites. The CVR, meanwhile, has a molded cap that encapsulates the tank and exterior components to catch escaping emissions and funnel them back into the fuel system.

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After the “K” Show we included in our newsletter information on the Bayer’s new Hybrid (Metal/Plastic) process. At the Automotive Interior Show we learned that the new [Volkswagen Polo features a hybrid front end](#) produced in an in-mold assembly process from three sheet steel inserts and the Bayer polyamide Durethan® BKV 130 H2.0. This involves- for the first time in a front end - the direct injection molding of the visible covering onto the structural component. The hybrid is produced by system supplier Expert of Barcelona.

Due to the high impact strength and rigidity of the Bayer polyamide, the front end can withstand high dynamic stress. In an accident it diverts impact energy enhancing the crash management capabilities of the vehicle. It is the first hybrid component produced by means of direct injection. The plastic melt is led directly into the cavity via heated runners, so that sprues no longer have to be removed from the structural component after demolding. For more information contact: Tom Erdner, Bayer Corp. 412-777-2500 or e-mail Thomas.erdner.b@bayer.com.

Electronics and Displays

Recently an alliance was announced to provide [a polymer that will meet the high resolution needs of LED Displays](#). Bayer AG, Leverkusen, Germany, and Cambridge Display Technology, a research organization that has developed extensive light-emitting polymer (LEP) technology, have formed an alliance to develop and commercialize a fundamentally new polymer.

Bayer's wholly-owned subsidiary H.C. Stark and Cambridge have formed the entity. The resin supplier will manufacture, market, and sell a co-developed, high-resistance version of polyethylene dioxythiophene polystyrene sulphonate. They say this "critical charge transport" polymer, trade named Baytron PEDOT/PSS, is critical in attaining high graphics resolution and pixel counts in LEP displays.

The LEP display market could reach \$2.5 billion by 2007 and is aimed at flat panel displays and lighting for applications such as electronic, consumer, and automotive products. Other resin suppliers, including Dow and DuPont, are ramping up LEP production capabilities and working to commercialize LEPs on plastic rather than glass substrates to expand their potential end-uses.

Packaging

[Snapple Beverages Corp.](#), a division of the Cadbury Schweppes Group, London, has announced that it is replacing the distinctive glass bottles for its iced tea and fruit drinks with a [20-oz hot-fill polyethylene terephthalate bottle](#) developed by Graham Packaging. Graham has also developed a similar patented PET bottle design for Snapple's new Elements Enhanced Water product line.

Before it was acquired by Cadbury Schweppes in 2000, Snapple introduced relatively low-volume beverages such as Sun Tea and Hydro Thirst Quencher in PET hot-fill bottles (also developed by Graham). The introduction of PET containers for the Snapple core products represents a complete conversion of the beverage company's best-known products.

The new hot-fill PET bottle helps differentiate the Snapple product in an increasingly competitive market. The new bottles employ Graham's "Active Cage" technology, which is claimed to yield stronger, yet lighter bottles with greater design freedom versus the competition. The technology uses a type of high-uptake vacuum panel that can be smaller than that of other hot-fill PET designs, does not need to be encased in a traditional rigid frame, and can be located anywhere on the bottle surface, according to Graham.

The new Snapple bottle has a 'waist,' a groove required to give it hoop strength and prevent distortion or ovalization after hot fill, that is both narrower and located farther down the bottle than existing designs. As a result the bell of the bottle is larger. Both the vacuum panel and waist of the bottle are covered by the product label. In addition the Snapple product logo is etched on the top part of the new PET bottle and is more finely replicated than on its glass predecessor.

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On another note...[Economics still is the deciding factor in selecting materials for any packaging application](#). In Argentina soft drink manufacturers and other companies will start replacing plastic bottles by glass bottles and packaging to reduce costs. After the devaluation, costs of plastic and aluminum multiplied. In the last decade glass bottling was almost replaced by Pet (a plastic imported resin). Products like soft drinks, soda, cooking oil, mayonnaise were bottled in plastic containers. The cost of the Pet bottle increased by approximately 140% since the devaluation

according to Coca Cola, causing an around 35% rise in the price of the product. Coca Cola Argentina will sell its soft products bottled in a new glass bottle. The company has invested around Pesos\$21mil to readapt it production line and the incorporation of bottles and boxes. Pepsico Argentina will continue to bottle its products in plastic bottles.

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The rumor surrounding the sale of the PET container business of Schmalbach-Lubeca is finally resolved. Amcor has reached an agreement to acquire the PET container and closure businesses of Schmalbach-Lubeca for \$1.5 billion (A\$2.88 billion). The acquisition makes [Amcor the world's leading producer of blow molded PET containers](#).

Schmalbach is the world's largest manufacturer of PET containers in North America, Europe, and Latin America with 2001 sales of \$1.4 billion euros (US \$1.3 billion). Schmalbach is expected to complement Amcor's existing PET containers operations in Canada and the Americas. In PET containers, Amcor and Schmalbach had combined 2001 sales of \$1.9 billion euros (US \$1.8 billion). They will operate 51 plants in 20 countries.

In closures, Schmalbach-Lubeca White Cap is a leading manufacturer of food and beverage closures with 2001 sales of \$516 million euros (US \$467 million). It has three plastic closure plants in the U.S. and Mexico. Amcor and Schmalbach's closures operations had combined 2001 sales of around 595 million euros (US \$539 million) and will operate 21 plants in 15 countries.

Polymer Developments

[Dow Chemical Co. has introduced ERL-4140 cycloaliphatic epoxide monomer](#) for use in developing new UV cure resins. This monomer contains an ester capable of alcoholysis or transesterification reactions with a variety of alcohols and polyols. These reactions allow formulators to develop a wide range of specialty resins, according to the company.

Formulators can use ERL-4140 cycloaliphatic epoxide monomer to prepare many different cycloaliphatic epoxide materials for use in a variety of end-use applications, including thermal- and UV-cured coatings, composites, electrical insulators, electronic encapsulation, adhesives, acid scavengers and chemical intermediates. Dow entered the UV cure market last year, when the company acquired CYRACURE™ cycloaliphatic epoxide resins as part of its merger with Union Carbide Corporation. CYRACURE resins are used in high-performance cationic UV cure applications that require outstanding processing and performance attributes, such as inks, coatings and adhesives. For more information go to www.dow.com.

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[GM, which publicly stated its plan to move to non-PVC alternatives, has been actively trying to use novel polyolefins](#) on its latest models. Last year, the company announced that TPO nanocomposites developed by Basell Polyolefins would be used in exterior applications in two 2002 GM mid-size vans.

Jane Maselli of A. Schulman Inc. says General Motors has recently approved the use of Schulman's line of polyolefin elastomers as alternatives to PVC in automotive interiors. The products, dubbed Invision Soft-Touch Elastomers, are intended for injection-molded arm rests, handle assists, console lids, shifter knobs, and other parts.

Schulman says the Invision elastomers offer molded parts that are soft and leather-like in texture, but resistant to scratching, weathering, and moisture damage. The materials reportedly remain ductile down to -40 °C, possess a low specific gravity (0.90), and are readily recycled with other olefinic car parts.

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Development work by Ticona, the technical polymers business of Celanese AG, indicates that injection molded end plates made of Fortron® polyphenylene sulfide (PPS) can provide significant cost and weight savings in proton exchange membrane (PEM) fuel cells. By integrating the end plate and the adjacent insulating plate into one functional plate, [Fortron PPS may reduce cost and weight](#) as much as 90 percent compared to [current fuel cell prototypes](#). Currently the PEM fuel cells use a stack of stainless steel plates that can cost more than \$300.00 per pair of plates.

Ticona's development work suggests that integrated injection molded plates made of glass-reinforced Fortron PPS that combine end and insulating plates may reduce plate cost to between \$100 and \$120 per stack. The switch from metal to plastic also should cut stack weight at least 10 pounds. Injection molding reduces manufacturing time to less than two minutes per plate versus the several hours needed for machined plates.

Ami M. El Agizy, Ticona's market development manager for fuel cells, says Fortron PPS has the purity needed to satisfy known electrochemical demands in fuel cells. Tests show this material has little effect on the conductivity of the fluids in contact with it. Fortron PPS grade 1140L4 generates only a 2 µS/cm change in conductivity in a 50 percent glycol solution after seven days. Maintaining low conductivity in the end-plates and minimizing ionic impurities which might leach into the electrolyte are key to continued fuel stack efficiency.

For more information contact: In North America – Ami M. El Agizy, Ticona, Phone: 1-908-598-4247. Fax: 1-908-598-4319. E-mail: Ami.ElAgizy@ticona.com.

Process Developments

[Web-based services from Bayer](#): At the Automotive Interiors show, Bayer Corporation made several announcements. Bayer Plastics has launched an online technical center. Located at <http://www.bayerplastics.com/>, the site offer: product data sheet, data for computer modeling, both single-and multi-point, profiles and photos of successful customer applications, thorough art and mold design guidance and easily-accessible troubleshooting information for avoiding or resolving processing problems, brochures on a wide range of topics and a link to BayerONE, Bayer's e-business portal.

Bayer also announced their product stewardship website, www.BayCareOnline.com. The website is a step in the evolution of the BayCare Progressive Product Stewardship Program, which has received industry recognition as the standard for the safe handling and storage of chemicals. This is the first website of its kind established by a polyurethane raw materials producer. It is designed with the health, environmental and safety professional in mind. For more information go to the site or call 1-800-622-6004.

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[Recycling- Will China show us the way?](#)

As the world's top consumer of electrical household appliances, China has at least 120 million refrigerators, 170 million washing machines, 400 million TV sets and 16 million computers in use. This data has been reported by the China Household Electrical Appliance Institute.

It is estimated that up to 4 million refrigerators, 5 million washing machines and 5 million TV sets will be discarded every year from now on. Lack of a recycling system in this field has resulted in loopholes in home safety, energy waste and environmental pollution, as electrical appliances are either being used beyond their expiration or randomly abandoned.

As a developing country, China has the opportunity to work out policies and measures that encourage the prompt recycling of unwanted electrical household appliances. Similar endeavors will be made for the treatment of discarded steel and iron, non-ferrous metals, plastics, rubber, paper, glass, used tires and dead batteries.

Just as in the US, there are numerous firms (as many as 5000) involved in some form of recycling in China with no clear policy or mandate for recycling.

Authorities in China claim rules for electrical household appliances, used tires, dead batteries and other major solid wastes will be hammered out by the end of this year.

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[Cinpres Gas Injection Ltd. has introduced a new gas-assist injection process](#) that employs nitrogen to sequentially hollow out part sections and act as a cooling media that can cut total cycle times by 20 to 40% compared to conventional gas-assist techniques. Called Gas Cool, the process is being used to produce four automotive parts in Europe and one in Brazil with potential to be used for large parts in other markets, such as furniture. A project under development is a one-piece automotive door panel module, which includes molded-in glove pockets with hollow trim. According to Cinpres, the cycle time for the part has been reduced from 110 sec using conventional gas assist to 75 sec with the Gas Cool process. During the hold stage of the new Cinpres gas-assist injection process the heated gas created by the melt is replaced by nitrogen chilled to about -25° C with a dew point of -30° C. As the secondary source of chilled gas is introduced, an outlet valve releases hot nitrogen from the mold while retaining the necessary back pressure to ensure part surface quality and dimensional stability.

Tooling/Product Design

Kruse Analysis Inc. has a marketing agreement with Sigmasoft GmbH, Aachen, Germany, to provide [sales and service of its suite of three-dimensional CAE design engineering software for the first time in the U.S., Canada, and Mexico](#). The technology was demonstrated by Kruse Analysis during the MassPlastics show March 27-28 in Fitchburg, MA. Torsten Kruse is the company president.

Sigmasoft CAE simulation tools, which are based on 3D volume elements derived from STL files, can simulate the injection molding of thermoplastics, thermosets, elastomers, liquid silicone rubber, and metal powders. They can also be used for overmolding and insert molding applications, he says. A Sigmasoft flow module is said to predict fill time, pressure, temperature, shear rate, and dynamic viscosity as well as flow perpendicular to the mold walls and into ribs. Kruse says it also simulates fiber orientation, jetting, and venting requirements. The corresponding cool module models inserts and heat pipes, if required. Another module calculates residual stresses and distortions for the part, mold components, and inserts, taking into account fiber orientation as well as the thermal effects of corners and edges. For more information visit www.Kruseanalysis.com.

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A partnership has been announced that will [enable designers and manufacturers of composite products to slash development time and reduce the cost of engineering](#) changes and material waste. Vistagy Inc. and the ESI Group will provide data integration between Vistagy's FiberSIM software, which engineers use to design composite parts, and PAM-RTM (formerly LCMFLOT), an advanced simulation software for liquid composite molding (LCM) from ESI Group. Resin transfer molding involves infusing resin into a mold cavity filled with a preform of reinforcing fibers. When working with a mold with a complex shape the fibers can move and compact unevenly during draping, which creates areas of varying permeability that slow or stop the flow of resin. FiberSIM software provides a complete design environment for composite parts, including a draping simulation tool that generates accurate data on fiber orientations. The software then provides this data to PAM-RTM software, which models the flow of resin around the preform fibers. The integration of FiberSIM and PAM-RTM software enables engineers to predict and correct potential molding difficulties without having to rely on extensive physical prototyping. Steve Luby, president and CEO of VISTAGY claims that the can offer designers working with liquid composite molding processes a capability that they did not have before. Now that they can provide a complete digital product definition that allows faithful simulation of resin injection processes, composites will become an attractive choice in a variety of applications.

References: The stories in *PolymerPlace Notes* come from a variety of sources including Company Press Releases, Interviews, the SAE and Automotive Interiors Shows and trade

publications like *Plastics News*, and newswires like the PR newswire www.Polymerplace.com
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