

PolymerPlace Notes

A plastics technology newsletter
By Margaret Baumann, G.H. Associates

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800.207.7659

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What's happening at PolymerPlace

We attended the Commercial Development and Marketing Association Fall meeting that was held in Hilton Head South Carolina October 19-21. The theme of the meeting was: Dealing with Disruption in a Winning Way- Converting Disruption into Growth. The conference focused primarily on the impact Biotechnology, Nanotechnology and Environmental Initiatives are having on the Chemicals and Plastics Industries- new routes to chemicals and polymers, property enhancements and smaller environmental footprints. The concept behind the conference was that these technologies should not be viewed as threats but opportunities.

One of our objectives for attending the conference was to begin to position our work more into these areas. As a result of that initiative, we are looking at developing a monthly newsletter on developments in Biotechnology and the impact they are having on Polymer materials, processing,

markets and applications. Much like Polymerplace notes but specifically on [Biotechnology](#). We are taking a poll of our readers to get a feel for whether a newsletter like this would be valued. [Please take a second to answer our poll regarding this: Click on the link \(there is just one question\)](#). <http://www.pollmonkey.com/p.asp?U=438836594>

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Strategic Management for the Plastics Industry was written by Roger F. Jones, one of Polymerplace.com's founding partners. It was published in September 2002 by CRC Press. Endorsed by the Society of Plastics Engineers, this book covers all of the bases in the plastics industry, from polymer manufacturing, through compounding, distributing, processing – even machinery and additive suppliers are included – in a thoughtful, down-to-earth discussion of the particular problems faced by managers in this industry in running their businesses. Worried about globalization? Can't decide how to staff and organize your business? Do general management texts fail to cover your special problems? Look no further – it's all in here. Order your copy today – use our link to www.amazon.com.

We've been showing highlights from each chapter in our monthly newsletters. This issue will cover **Chapter Eight – The Role of Acquisitions, Joint Ventures and Divestitures**. The author first discusses the principal reasons for making acquisitions and points out the advantages and disadvantages of this approach to growing your business, and then discusses specific reasons, such as access to new markets and new technologies, or increasing manufacturing capacity. He shows when these are sound ideas and when they are not. He also describes why and how many acquisitions go wrong (documented with some horror stories!), then goes on to explain how to avoid picking the wrong ones, and how to plan for and make an acquisition work right from the minute the deal is closed. The advantages of joint ventures are described, particularly as a prelude or alternative to acquisitions. Joint ventures are particularly attractive in overseas countries but also pose some special challenges.

The author shows how to decide if a divestiture is needed and then what to do. Finally, the chapter deals with selling your own company, or, conversely, what to expect and how to handle the situation when the company for which you work is unexpectedly sold.

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Are you interested in [listening more to your customers](#)? If so read on...

Recently we learned about two surveying and polling tools that are powerful, free and perfect for getting direct insight into what customers are thinking. In less than ten minutes, you can create a professional looking poll with one question and up to 50 choices for answering. Respondents are tracked with a harmless cookie (so they can vote only once) and when they complete the survey you can show them a message or let them see the poll results. The poll on the Biotechnology newsletter is an example of the polling program. Although the free poll (www.pollmonkey.com) is limited to 100 respondents. This is enough for a lot of small businesses. If you want to upgrade to more respondents the fee is only \$20.00 per month.

The survey format is called Survey Monkey (www.surveymonkey.com). The free version of Survey Monkey limits your survey to no more than 10 questions and 100 respondents but this is more than enough to handle a quick survey. The best way to distribute the surveys is by sending respondents an e-mail message containing the survey URL. It can also import an e-mail list to generate your e-mail invitations automatically. The e-mail list is ideal if you want to track customer responses. For more extensive survey demands SurveyMonkey charges \$20.00 to field 1000 responses per month.

We will be incorporating this survey feature ourselves in future newsletters.

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Structural Plastics Conference Will Include New Sessions ... SPI's Structural Plastics Division (SPD) recently announced plans for a Commercial Technical Session, to be held during the group's 32nd Annual Conference and Design Competition, March 23-24, 2004, in Charlotte, NC. The technical session, a unique departure from the non-commercial sessions and design competitions that have marked past SPD conferences, will include advanced papers on a variety of innovative processes, emerging business issues and new markets in the structural polymer industry, and will provide participating companies with an opportunity to promote their new products and services. The 2004 Structural Plastics Conference and New Product Design Competition will be co-located with the Plastics Encounter Southeast Trade Show and products entered into the competition will be showcased in a special Design Gallery on the exhibit hall floor. Awards will be presented to those companies entering the most innovative commercial products in their market category. Conference abstracts will be accepted until November 3, 2003. For guidelines on submitting technical papers or additional information about the conference, visit SPD on the Web at www.plasticparts.org or contact Karen Miles, (202) 974-5247; e-mail kmiles@socplas.org.

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POLYMER MARKETS

Pharmaceutical packaging

Ticona, the technical polymers business of Celanese AG has developed the first cyclo-olefin copolymer (COC) blends that allow [blister packaging made from Topas® COC film](#) to be steam sterilized. These blends enable Topas® COC-based film to be used as a barrier material for sterile products, such as single-dose liquid medications and other drugs, solutions and veterinary pills.

The new family of formulations combines Topas® 6013 COC and a polyolefin to create heat-resistant films that do not distort when heated to 121°C for 20 min. Films made with the blend are relatively rigid and have a low water vapor transmission rate.

These films have almost no shrinkage or warpage in thermoforming and provide an even wall thickness throughout. The blisters made are either translucent or white and have good surface smoothness and gloss. In addition, the blend's ductility means that its films generally do not create sharp edges or whiskers when die cut, so they could be considered for use in infant-care products.

Topas® COCs are highly pure, contain no halogen compounds, and exhibit good hydrolytic stability and extremely low moisture absorption. They also offer excellent biocompatibility and are low in extractables, so they meet U.S.P. Class VI requirements and have received U.S. FDA Drug and Device Master File numbers.

An FDA Food Contact Substance Notification permits their application in direct contact with all food types under all conditions of use. In addition to blister packs, prefillable syringes and other types of pharmaceutical packaging, they are good candidates for use in medical and diagnostic devices, optical components, capacitor films and printer toner binders.

For information on the new Topas® COC-polyolefin blends or on Topas® COC grades for potential use in blister packs and other applications, contact: Ticona, 90 Morris Avenue, Summit, New Jersey, 07901, USA. Phone: 1-800-833-4882 or 1-908-522-7500. Email: prodinfo@ticona.com. In Europe: Phone: +49-(0)180-584-2662 (DE) or +49-(0)693-051-6299 (EU). Email: infoservice@ticona.de. Or visit <http://www.ticona.com>.

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Automotive

In last month's newsletter we reported on the TPE conference which was held in Akron. [Robert Eller spoke at the SPE TPE conference](#). His focus was the growth of TPEs in Automotive Applications.

Apart from the current high market share and rapid growth potential represented by automotive applications, he suggested that the [auto market is a key driver for new TPE technologies](#). The new technologies developed for automotive applications are often adapted in other sectors. (Some examples of this technology migration are: 3D blow molding, foam extrusion, and coated fabrics.)

The transfer of economic pressures from automotive OEMs to their materials and module suppliers is driving a shift in the position of TPEs in the value chain and providing a major incentive for TPE growth and profitability.

Resin price increases (starting in late 2002) combined with vehicle price decreases have created a squeeze on Tier 1 supplier profits, which in turn provide incentive for TPE materials and process innovations capable of adding value while providing cost savings.

Tier 1 consolidation has created a substantial increase in purchase power (pressuring prices downward) as well as incentives for in-house TPE compound manufacture (e.g., for body seals, acoustic damping compounds, and skins formulations).

The continuing vehicle market share loss by domestic OEMs to non-domestic competition is stimulating the entry of Japanese and European compound and process technology.

The relatively higher profitability of non-domestic OEMs sustains a higher level of product and process development (see the exhibit below).

In the current economic environment, many automotive OEMs are unprofitable. The higher profitability of the Japanese OEMs allows greater investment in new materials technology, which has translated to higher value TPEs and earlier introduction of TPE solutions (TPV body seals in Japan, for example).

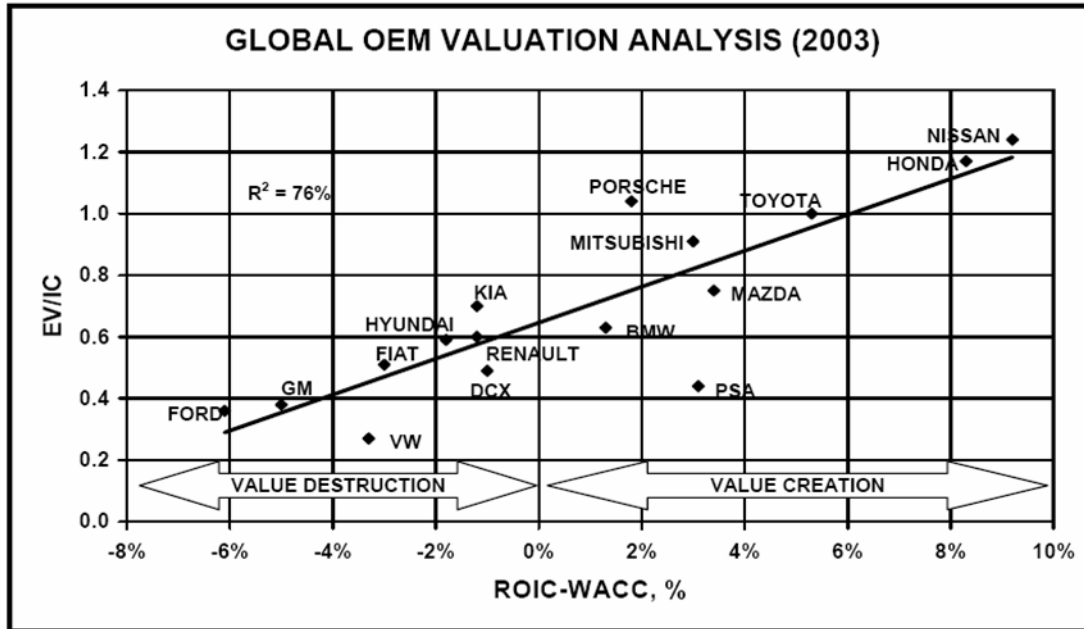
The economic and technical driving forces for automotive materials and process substitution favor the use of TPEs.

- Light weight solutions have always been an automotive materials substitution driving force. The recent increased emphasis on fuel economy in (and the pressures to re-examine CAFE legislation) in order to defend the profitability of SUVs and light trucks in the N. American market will make weight savings a major driving force for TPE material and process substitution.
- Auto Interior Soft Trim and the Role of Two-shot Molding -- Auto interiors are emerging as a major growth opportunity in automotive TPE applications Key among these interior growth applications are skins, skin/foam laminates, coated fabrics, airbag doors, and non-carpet flooring. Substitution of TPO skins (initially vacuum formed) started in Europe and has spread to N. America and Japan.

Initial large area applications for two-shot molding of large parts with TPE surfaces are likely to be in door trim panels and rocker panels with the potential for extension to instrument panels.
- Coated Fabrics -- In combination with leather, PVC coated fabrics are widely used for automotive seating. Coated fabrics represent a large potential market for TPO and some SBC-type TPE competitors. Recent compound developments and receptivity by European and Japanese auto OEMs suggest that penetration of the coated fabrics sector by both styrenic and olefinic TPE coated fabrics will begin in the next model year in seating and security shades. The development of RF sealing methods for TPOs will facilitate this penetration.
- The Role of Foams -- Foaming brings value to TPEs as a result of softness, energy absorption (depending on thickness and foam structure), acoustic properties, and the potential for cost savings when they are integral with the skin or other surface material

(e.g., textiles). The combination of foaming with two-shot molding offers the potential for both cost savings and the addition of value to the constructions in which they are used.

EXHIBIT 3



SOURCE: GOLDMAN SACHS

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Industrial

A new flowmeter from Digmesa AG (Ipsach, Switzerland) uses VICTREX® PEEK polymer components to provide high-precision volume metering with minimum pressure loss. The Digmesa Flowmeter EPI is used for measuring the fluid volume of high viscosity media such as syrup, oil and detergent concentrate. The main benefits of using PEEK polymer is its excellent resistance to chemicals, which is why these flowmeters can also be used for volume metering of very aggressive media, even at high temperatures. Also important is the fact that the polymer complies with the regulations of the U.S. Food and Drug Administration (FDA) which extends the range of applications to the food processing industry. PEEK polymer is used for the two epicycloid vanes located in the flowmeter's two epicycloid turbines. The hollow body and cover are welded to each other after the pulse generator has been fitted. The metering function is based on two epicycloid turbines being driven by the medium flowing past them, with the relative position of the two vanes to each other being controlled by gear wheels that are engaged. Magnets integrated in the turbines then generate measurable pulses using an electronic system. Depending on the viscosity of the medium, which may be between approximately 5 and 8000 centistokes, flow rates from 0.016 to 4.2 gal/min (0.06 to 16 l/min) can be recorded with an accuracy of $\pm 1\%$ and very little pressure loss. The low pressure loss, which has been measured at less than 3.3 psi for a flow rate of 1.3 gal/min of cola syrup (approximately 24 centistokes), can only be achieved by the ease of movement and geometric precision of the turbines. This reproducible tolerance requirement is another reason why Victrex® PEEK polymer was chosen.

For more information on the properties and performance advantages of VICTREX® PEEK polymer, please call (800) VICTREX or visit the Victrex website at www.victrex.com.

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POLYMER MATERIAL DEVELOPMENTS

Kureha has recently introduced a new barrier resin material. PGA (a polyglycolic acid) is a polyester and has excellent barrier properties in high-humidity environments. Currently manufactured on a pilot plant scale in Japan, they plan to scale the product up in anticipation of approval in European and US food packaging applications. Full scale production is planned for 2006. They hope to be able to supply the market with PGA priced at a comparable level to EVOH and Polyamide MXD6 which are competing barrier materials. At a relative humidity of 80% the resin outperforms its competitors by an order of magnitude for oxygen and carbon dioxide permeability. This is especially important in applications such as packaging of wet products like beverages and solid foods in brine.

PGA can be processed in combination with plastics such as PP(polypropylene), PE(Polyethylene), PET(polyester) and Polyamide. The processing temperature window for biaxial orientation is 40 to 100 degrees C versus 80-90 degrees C for EVOH. PGA can be coextruded or blow molded in multilayer structures incorporating PET without the need for an adhesive layer. Kureha claims puncture strength is an order of magnitude higher than EVOH.

PGA is second in a line of barrier resins offered by Kureha. They also market Besela, which is a lamination film comprised of PET, oriented Nylon, or oriented PP film substrate and a polyacrylic acid barrier film. Oxygen barrier properties of Besela are in the same range as inorganic SiO_x film based products, while moisture permeability is very similar to EVOH. Since it is an organic film it stand up better to physical abuse than inorganic barrier films and metallized films.

Currently Besela is being used in stand-up retort pouches for products such as mushrooms, sweet corn, soybeans in brine and soups.

Some of the markets Kureha has targeted for PGA and Besela products are: bottles, cans, metallized films and the paper laminate market.

For more information visit: <http://www.kureha.co.jp/eng>

PROCESS DEVELOPMENTS

The last two NPEs (National Plastics Exposition) have had more and more booth space dedicated to technologies for improving productivity in plastics manufacturing. As we all too painfully know over the last three years a lot of higher volume plastics manufacturing has gone overseas. To stay competitive with a lower cost labor market we need to stay state of the art in plastics technology and productivity tools.

Robot vendors at the NPE were responding to growing demand for greater value added functions- from vision systems for parts inspection and identification to downstream operations like degating, trimming, assembly and packing. Six- Axis, jointed-arm robots which are typically used for secondary operations were more plentiful at NPE 2003 than they have been in the past.

More suppliers are opting for PC-Based Windows software and icon-based graphical interfaces to make robot programming easier. Also new is PC-based simulation software that gives users a new way to program robot sequencing and spot trouble without building a prototype cell. Working with the power of a PC rather than a PLC is one way to take automation to new levels of use.

Companies involved in [robotics](#) include: Husky, Fanuc Robotics, Mark 2 Automation, Yushin America, Staubli Robots division, Conair and Wittmann.

We are told that even smaller short run and specialty molders are beginning to see the value of robots in their operations.

References: The stories in *PolymerPlace Notes* come from a variety of sources including Company Press Releases, Interviews, and trade publications, e.g. *Plastics News* and newswires.

<http://www.PolymerPlace.com>

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