

PolymerPlace Notes

A plastics technology newsletter

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Volume 2

August 2001

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Feature - [Marketing in a Recessionary Environment](#)

Consumer - [Biodegradable polymers](#)

Consumer - [New lines of performance fabrics for the activewear market](#)

Electronics - [Circuits entirely from semi-conducting polymers](#)

Packaging – [New joint venture Schmalbach-Lubeca AG and Silgan Holdings Inc.](#)

Packaging – [New replacement for paper bags for use in fast food and retail consumer bag markets](#)

Transportation - [Two articles illustrate advances that result from material and process working together improving performance...](#)

Tooling /Prototyping [Water Clear stereolithography resin capable of providing the optical clarity of many polycarbonate resins](#)

Material Developments - Self-healing materials;--- A new grade of its GUR ultra-high molecular weight (UHMW) polyethylene for use as a microporous matrix for sintered plate filters; ---A new grade of HIPS; ---A line of electronic interconnect devices reported to be the world's smallest ever molded

Process Developments – Japanese-owned molder of television housings has installed a 1,760-ton Sandretto Mega injection machine, billed as the largest press in Scotland; --- training CD entitled "*Designing for MuCell*"; --- a new technology developed by Petrecycle Pty. of Australia to recycle PET, reported to be the most efficient process available in the world today ---

New Studies available at PolymerPlace:

[POWDER INJECTION MOLDING-Industry Overview and, OVERVIEW OF THE MARKET FOR PLASTICS MATERIALS](#), also recently added [Spotlight On Thermoforming, Failure Analysis of Plastics by Barbara Gedeon of Bodycote Broutman](#)

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Feature Story- Marketing in a Recessionary Environment

When times are slow where should you cut back to save money? Many plastics industry business managers watching their cash flow tighten are wondering why they are exhibiting at several trade shows like Plastics USA and the K Show in Germany. The Society of Manufacturing

Engineers is warning its members not to cut trade show participation in a downturn. Gary Mikola, SME's director of Expositions says he has seen many member companies utilize an economic downturn to their advantage. "While their competition is cutting marketing expenses, many of our customers are utilizing their sales teams and trade show dollars to gain market share by increasing visibility and establishing their stability with current and potential customers," says Mikola. Trade shows are in fact the most efficient way to make multiple customer contacts in a short period of time. We at Polymerplace certainly agree. In fact we plan to attend Pack Expo in Las Vegas September 10-12 and the SPE Thermoforming Conference September 15-18.

Getzler & Co., a New York-based corporate consulting firm also supports Mikola. They feel that most companies experiencing a slowdown in cash flow are better off reducing operating costs rather than cutting sales and marketing costs. The company says that its research shows that 88% of the decision makers that attend shows agree that their attendance at trade shows helps them decide what products and services to purchase.

Another important consideration is planning in advance the organization of trade show activities. Trade shows are a lot of work especially if you do them correctly. This means your participation has to be well organized and orchestrated with lots of advance planning.

Exhibitors at the K show are likely to find that attendance will be adversely affected by the economic downturn in the US. The last K-Show was affected somewhat by the downturn in the Asian economy. That is not the case this year and exhibitors are likely to see many Asians at the show.

Trade shows are an important part of your marketing efforts. If you can't afford to exhibit you should at least attend as many of them as your budget will allow.

Polymer Markets

Consumer-Developments in Biodegradable Polymers

In past newsletters we have updated you on developments in biodegradable polymers. Here are two applications that really are appropriate for a biodegradable polymeric material.

Millennium Plastics recently announced that the company is supplying developmental quantities of a new resin for use in biodegradable shotgun wadding for the European market. The company is working with a world scale supplier of shotgun ammunition. Paul Branagan, MPCO president says "With about 1.5 billion shotgun shells sold annually in the EU alone, we expect that this kind of business activity will have a significant impact on our sporting-goods business sector," says Branagan.

The wads are water-soluble and biodegradable in the soil with the only byproducts being water, atmospheric gases and the resultant biomass.

The company says the first order it has received will be used to produce shells for testing and evaluation in preparation for commercial scale production.

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Cargill Dow LLC and several of the fabric industry's leading manufacturers unveiled new lines of performance fabrics for the activewear market at the Outdoor Retailer Summer Market 2001. The new fabrics are being developed with NatureWorks(TM) fibers, the first performance fiber made entirely from annually renewable resources such as corn. The polymer is a polylactide polymer Cargill-Dow worked with the Draper Knitting Company, Kanebo Gohsen and Penn Nyla to develop each of the new fabrics launched at the show that will target different segments of the outdoor market, including outerwear, running, cycling, hiking and other active sportswear categories.

Despite the diversity of target applications, all of the new fabrics have one thing in common, the source fiber. It has been about 30 years since a new fiber synthesized from a totally new starting material has been introduced to the marketplace. Like any new fiber, performance that is on par with, or superior to, incumbent materials is a must. The all-natural claim makes the fiber even more interesting.

The inherent benefits of the resulting fabrics include excellent moisture wicking, superior hand and drape, and functionality. In addition, the fibers do not support bacterial growth and have low

odor retention. By substituting corn for petroleum, NatureWorks uses 20 percent to 50 percent less fossil resources than conventional polymers, adding environmental benefits to the performance attributes of the fibers. The only fossil resources consumed in NatureWorks fibers production is in process energy.

Draper Knitting Company, a producer of conventional circular knits, high-pile sliver knits and nonwovens, has unveiled three spun pile fabrics made with NatureWorks fibers. The fabric applications include active outerwear and apparel.

Kanebo currently manufactures a range of synthetic fibers and resins and the company is introducing NatureWorks fibers in 10 fabrics to the market, from circular knits including a performance fleece and sweater knits to woven rip-stop, taffeta and denim.

Penn Nyla is a fully vertical warp and weft knit fabric manufacturer and plans on introducing several filament fabrics and one spun yarn fabric made from 100 percent NatureWorks fibers for the activewear market.

For more company information, please visit the Cargill Dow Web site at <http://www.cargilldow.com>.

Electronics

Siemens researchers in Erlangen, Germany say they have succeeded in producing integrated circuits entirely from semi-conducting polymers. According to Siemens they have reached the highest value for mobility of charge carriers at 0.2 cm²/Vs.

Siemens says the technology will reduce circuit prices to the level where electronic circuits can be used for just about anything from tracking airline baggage to identifying clothing in a washing machine.

Low-cost production techniques will eventually allow polymer materials to be dissolved in appropriate solvents and printed like electronic ink to form the necessary structures. Siemens believes polymer circuits will be produced in the future in much the same way newspapers are printed today, as opposed to the current process being used to produce a semiconductor that takes weeks.

Packaging

Schmalbach-Lubeca AG and Silgan Holdings Inc. have combined their plastic and metal closure operations into a new joint venture. White Cap LLC will be headquartered in Downers Grove, Illinois. The firm will employ 1,500 at seven plants, and will generate annual sales of about \$270 million. About 20 percent of its sales will be generated by plastic closures, according to Walter Hannan, White Cap LLC's vice president of human resources. He said future growth will be driven by plastic and composite products.

The companies announced the deal June 29. The merger may be the perfect solution to what could have been an adversarial relationship between the two packaging leaders. The marriage creates a premier supplier in terms of closure solutions for the food and beverage industry.

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As a replacement for paper bags in use in fast food and retail consumer bag markets, bags made from coextruded film of high molecular weight high density polyethylene (HMW-HDPE) with low density (LD) and Linear low density(LLD) achieve a combination of properties—stiffness; tensile; tear, puncture and optical properties—not attainable by blending LLD or LD with HDPE.

The optimum coextrusion to meet a balance of these requirements has a core (80%) of HMW-HDPE. For bags requiring only exterior gloss, a LLD/HMW-HDPE structure is adequate; if clarity is needed, an LLD/HMW-HDPE/LLD structure is suggested.

This information and supporting data is from a 2001 TAPPI paper presented by Leonard Cribbs of Equistar Chemicals. To view graphs and charts presenting specific data described in the paper, please visit the Equistar website: <http://www.equistarchemicals.com/>.

Transportation

The following two articles illustrate advances that result from material and process working together to improve performance...

STK LLC, a Uniontown, Pa.-based truck accessory producer has introduced a lightweight Procover pickup-truck tonneau cover. Lustran 752 ABS and Centrex 485 weatherable polymer were chosen to replace the fiberglass that commonly had been used for other versions of the 6 1/2-by-6-foot cover.

All covers on the market are fiberglass. This is the first successful attempt at replacing fiberglass products with a thermoformed cover. The product needs no tools and no drills for installation. In addition, the fiberglass pickup-truck covers need to be painted and assembled. The thermoformed cover has a leather look needing no additional finishing. STK thermoforms two sizes of the cover to fit full-size and compact pickups. The cost of the covers is about 30-40 percent cheaper than fiberglass, the company claims.

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Most airbag covers have been produced from thermoplastic elastomers but Ticona has convinced at least one Tier I that not all airbag covers need to be made from a TPE. Autoliv recently specified a Vandar thermoplastic alloy from Ticona for a complicated airbag cover that uses a two-shot molding process. The part weighs 3.5 pounds and takes up one-third of the instrument panel on which it is installed. It is also designed with an air vent opening and allows deployment through a 5 in. by 9 in. door.

While the company won't release the name of the automaker or model that will use the airbag, the injection molder fabricating the part, Mayco Plastics, is using some state-of-the-art technology to mold a unique part. The airbag door is molded on a rotary injection molding machine where one shot of one grade of thermoplastic polyester alloy is shot and then a second, softer grade is over-molded that provides texturing. Finally, a soft-touch polyurethane coating is applied without the need for any primer or adhesion promoters.

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Material Developments

Researchers at the University of Illinois at Urbana-Champaign created epoxy composites that can repair deep, hidden, small cracks in parts made of the composites. Such self-healing materials could solve problems in industries ranging from aerospace to electronics. Boeing Co. and Motorola Inc. are among the funders of the UI project.

Aircraft firms extensively use thermoset composites and electronics companies rely on such materials for high-density circuits. The materials often are brittle.

The scientists at UI created an epoxy composite that contains microspheres of dicyclopentadiene monomer. When a crack starts, it tends to impinge on a microsphere, breaking it open. The DCPD monomer polymerizes into a tough polymer as it contacts Grubb's catalyst, a ruthenium-based chemical, that is present in the composite.

The research team, led by Scott White of UI's Department of Aeronautical and Astronautical Engineering, has been going on for about six years, according to Nancy Sottos, one of the researchers. Past supporters included the U.S. Air Force.

The eight-member team reported its results in the Feb. 15 issue of the scientific periodical *Nature*. So far it has encompassed low-temperature-curing epoxies common to commodity applications. The group will look at high-temperature curing polymers, thermoplastics and other catalyst and monomer systems.

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Ticona has developed a new grade of its GUR ultra-high molecular weight (UHMW) polyethylene for use as a microporous matrix for sintered plate filters. Ticona collaborated with German

filtration manufacturer Herding to develop a new grade that provides the proper particle shape and pore size distribution to balance high strength and a low pressure drop in the filter. Ticona said the new UHMW-PE also offers the required chemical and thermal resistance and hydrophobic properties for the filter. The flexural rigidity and dimensional stability of the UHMW-PE allows the filter to be installed as a self-supporting element. The elements are coated with PTFE and offer high separation efficiencies delivering clean gas particulate levels below 1 mg/mE3 in the sub-micron range. The filters are used to remove fines from process and exhaust streams in the paint, chemicals, laser cutting, mining, glass and other industries. Contact Louie Wang at 800 242-8469 or visit their website at www.ticona.com.

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A new grade of HIPS (high impact polystyrene) resin available from BASF offers high gloss and improved melt rheology. These improvements offer processors easier molding, especially in molds that contain long flow paths. The company reports that high surface gloss can be obtained at reduced mold temperatures. This translates to shorter cycle times that offer processors higher productivity. BASF suggests Polystyrene 555 G is ideal for refrigerator interior fittings, sanitary ware and other home appliances where a high surface finish is desired. For more information visit the BASF web site at www.basf.com.

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Injection molder UFE, Stillwater, Minn., has specified a grade of Ticona's Fortron PPS (polyphenylene sulfide) for a line of electronic interconnect devices reported to be the world's smallest ever molded. The device is called a PIN sled and measures 0.080 x 0.181 x 0.307 and weighs a mere 60 mg. The part has a wall thickness of 0.010 to 0.030. UFE selected a mineral and glass-filled PPS (Fortron 6165A6) because it offered the dimensional stability, thermal resistance, strength and moldability required for the micro part. UFE is molding the part for Agere Systems. The interconnect is used to form an interface between optic and electronic components and serves as the mounting package for a photodiode receiver and mating optical connector. For more information contact John Dole at 908-598-4139 or send him e-mail at john.dole@ticona.com. The UFE web site can be found at www.ufeinc.com.

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Process Developments

Tenma (UK) Ltd., a Japanese-owned molder of television housings has installed a 1,760-ton Sandretto Mega injection machine, billed as the largest press in Scotland, to support the firm's move into new markets.

The new press, complete with gas-assisted injection capability, is being deployed to make parts including 32-inch TV housings, while also allowing Tenma to turn out very deep parts and other components for new industries. The latest addition at Cumbernauld-based Tenma (UK) is part of a recently completed £2.5 million (\$3.6 million) investment in a new manufacturing facility. This plant includes a double-oven spray painting line.

Tenma (UK) runs 27 injection presses, including two of 1,430 tons. The Sandretto is Tenma's first large, non-Japanese supplied machine. The 50-year-old parent company has five other molding facilities in Japan and two in China.

The European subsidiary formed in 1989 to supply TV equipment manufacturers, and has since diversified to make parts for other customers.

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Over the last year we have included numerous updates on the "MuCell" process. Trexel, Inc., developers of what has been one of the more innovative process improvements to injection molding in recent years, has developed a training CD entitled *"Designing for MuCell"*. The company says it will give the CD to new licensees to help them better understand how to design molds and parts for the MuCell process.

There are currently over 100 MuCell licensees. Trexel has taken its experience and insights in working with designing molds and products to create this support product. The company will

launch the CD at K-2001 where it will also have engineers present to answer questions, and where three machine makers – Arburg, Engel and JSW – will have machines using the process in their respective booths.

Trexel technical director Kent Blizard will also give a paper at KPLAST entitled "A New Cost-effective Modification to Retrofit Twin Screw Extruders for the Manufacture of Microcellular PVC Products."

For more information, contact Trexel at 781 932-0202 or visit their web site at <http://www.trexel.com>.

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Mossi and Ghisolfi, the Italian PET maker that acquired Royal Dutch/Shell's PET business, has purchased a new technology developed by Petrecycle Pty. of Australia to recycle PET. It is reported to be the most efficient process available in the world today. The "Renew" process is described as a chemical and heat process, as opposed to a mechanical process, which separates the PET from glue used for labels, pigments used in colored bottles, and barrier layers, using a molecular separation technology. Recyclate produced by the system has gained FDA approval for reuse in food containers. M&G are installing the process, capable of recycling 10,000 m. tons/yr. at a newly upgraded PET facility at Point Pleasant, W.Va. The plant is scheduled to be operating by October. By the beginning of 2002, M&G says the plant should be capable of generating \$13 million worth of recycled material at a price equivalent to current virgin material.

Tooling /Prototyping

DSM Somos, New Castle, Del. has recently introduced its Somos 10120 Water Clear stereolithography resin capable of providing the optical clarity of many polycarbonate resins. Designed to work with solid-state lasers, DSM says it has been evaluated with a variety of systems and shows excellent compatibility. 10120 is said to rival the flexural strength and modulus of PC resin and has a notched Izod impact strength similar to nylon 66 with a tensile strength equivalent to ABS resin. For more information on 10120 e-mail Michelle Wyatt at Michelle.Wyatt@dsm.com.

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

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August 2001