

PolymerPlace Notes

A plastics technology newsletter
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We hope you have a wonderful Holiday season! Since we have been back from the K show time has just flown!

Two sessions on Biotechnology planned

Larry Drumm (BioLarry Consulting) and Maggie Baumann (G.H. Associates) the author of this newsletter are organizing two sessions on Industrial Biotechnology in Plastics in 2005. The first session will be at the 2005 GPEC conference scheduled for February 24-25 in Atlanta Ga. Sponsored by the SPE Plastics Environmental Division, the conference is designed to cover the latest technologies regarding Plastics and the environment. We are planning a session dedicated to Bio based material technology. Speakers from the following organizations have been invited to participate in the session: Metabolic Explorer, MBI, Cargill, Dupont, Metabolix and The Biotechnology Organization (Bio.org).

The second session will be at ANTEC 2005 that is scheduled for May 1-5 in Boston, MA. The New Technology committee of the SPE has recommended that a New Technology Forum be organized on Industrial Biotechnology and Plastics. We are scheduling a half day session and the following organizations have been invited to participate: Michigan State University (Larry Drzal), Metabolic Explorer, Cargill Dow, Dupont, Metabolix and P&G(Proctor and Gamble).

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SPE hosting annual Global Environmental Conference

The Environmental Division of the Society of Plastics Engineers is hosting its annual Global Environmental Conference (GPEC 2005), which includes technical papers, student posters, exhibits, and presentations from outstanding plenary speakers. This event is attended by leading professionals in the plastics, environmental, and energy conservation fields. The conference subjects are selected to provide business executives and professional, engineers, molders, tooling shops, test instrumentation companies, and university students a valuable update on the

latest innovations and technologies including reduction in cost, and improvement in quality. Business connections made among the attendees are important part of the conference.

Technical Tracks:

- Automotive
- Business Equipment/Electronics
- Biodegradable/Biorenewable Materials
- Supply and Markets
- General Subjects (Legal, Fracture Testing, Quality)
- Regulatory
- Packaging
- Appliances

Prior to the start of the conference, the Marketing and Management division of the SPE (Society of Plastics Engineers) is offering a workshop on doing market research online.

Workshop: Competitive Intelligence Methodology Wednesday, February 23, 1-4 PM

The Marketing and Management Division of the SPE (M&M) has formed a partnership with the Commercial Development and Marketing Association (CDMA) to offer their courses at SPE venues. M&M and CDMA will be holding an intensive, hands-on “Competitive Intelligence Methodology” workshop in conjunction with GPEC 2005. The workshop will describe useful tools for developing meaningful projects, information, and analysis that will result in relevant recommendations for business action. These tools include scoping and proposing relevant projects, current on-line information services, patent information sources, and the basics of Multi-Term Frequency Analysis. There will also be pertinent competitive intelligence case studies provided to the attendees of the workshop.

The workshop will be moderated by Maggie Baumann of G.H. Associates, and the instructor will be from CDMA. The workshop will be held just prior to GPEC 2005 Conference. The cost of the workshop is an additional \$95 for GPEC 2005 registered attendees. There will be a cash bar reception following the workshop in order to give attendees an opportunity to meet and exchange ideas.

K Show - Commentary

The K show has now become almost the only exhibition at which one can see the latest developments in materials. It seems that the material suppliers are reluctant to exhibit anywhere else; certainly, NPE has seen a major exodus. GE Plastics was the only global polymer producer that did not exhibit and they are under significant internal pressure to improve their earnings. In addition to this observation there was a lot of discussion regarding expansion and investment in China across the board among all manufacturers.

The following is a review of the highlights of the show contributed by Roger Jones and Maggie Baumann of PolymerPlace.com.

The K2004 Show in Düsseldorf

The triennial “K” (for Kunststoffe) Show took place, October 20-27, 2004. The organizers of the show made a significant change from previous shows, by raising the daily entrance fee from 2001’s level of DM 25, to € 55, equivalent to going from about US\$ 14 to US\$ 70! Interestingly, the show’s attendance showed little adverse affect, attracting 230,000 visitors, slightly more than the 2001 level of 228,000. Many exhibitors thought the quality of the visitors was improved, e.g.,

more actual buyers of materials and machinery attended than members of the general public only there to pick up free molded samples. Exhibitors totaled 2914, up slightly over 2872 in 2001.

The K show has become not just the premier show in the world for polymers and plastic materials, but is now nearly the only such show. NPE in 2003 was notable for its near abandonment by a substantial number of material manufacturers, leaving their representation to distributors; Plastics USA and regional North American shows have always been primarily machinery shows. Consequently, it was both surprising and disappointing to note that only 3-4% of the total attendance at K came from the US and Canada.

General Electric Plastics was the only major global polymer producer not to have a booth at K2004 (it did exhibit in K2001) and its absence provoked considerable speculation as to the reason. GE has quietly terminated its Polymerland distribution business and downgraded LNP Engineering Plastics to a global business group, LNP Products. Machinery producers filled their halls with huge machines, almost all of which were sold on the spot. As an aside, it was a blessing to this visitor that the K management groups exhibitors with similar products together, unlike NPE with its chaotic distribution of exhibits that requires walking from pillar to post, in order to keep appointments with producers of particular products. Even the halls featuring services, publications, and lab equipment exhibits were humming with activity. The hours are 10-6:30, so that visitors have a very full day indeed during the eight days of the show; exhibitors may enter at 9 AM and can visit one another readily before non-exhibitors are allowed in.

Some of the highlights...

1. Industry News. Basell, the polyolefins giant recently put up for sale by present owners BASF and Shell Chemicals, has now attracted interest from Asian and Middle East firms. SABIC (Saudi Arabia), Reliance (India), and NPC (Iran) all suggested that they had serious interest, in addition to their own largely domestic expansion plans. NPC also announced nine new major olefin production plants, with startups scheduled in 2004 through 2008; while the investment amounts were not specified, they clearly will be into multiple billions of dollars. Additionally, NPC is contemplating investing in China. Reliance also announced \$ 2B in expansions for PET, PP, and polymer feedstocks.

Degussa announced that it was acquiring a majority interest in Changchun Jida, a Chinese PEEK producer, which also produces PES. The other PEEK producers, Victrex and Gharda, announced substantial expansions of their capacities in the next two years. BP and NOVA Chemicals Corporation. announced today that they have reached an agreement in principle to combine their European interests in Styrene Polymers to create one of the largest polystyrene and expandable polystyrene manufacturers and marketers in Europe. BP and NOVA Chemicals will each have a 50 per cent stake.

The proposed joint venture, which is subject to a number of regulatory and other consents, is expected to commence during early 2005, and be headquartered in Fribourg, Switzerland.

Basell also announced the formation of a "no frills" Polypropylene venture to sell commodity polypropylene recognizing the changing nature of the buyer of commodity resins called Alastian. Many buyers do not have a need for the R&D and development services that have been associated with resin specifications historically. Resin suppliers are recognizing they need to differentiate services for different customers.

Atofina announced the formation of Total Petrochemicals and Arkema Chemicals. The former will include Polyolefins and Arkema is now the home of performance polymers and specialty chemicals. (a la Solutia and Celanese in the last couple of years).

Lanxess was formally on display as the Performance Chemicals and Polymers arm of Bayer. It includes Styrenics, additives, engineering plastics, and performance rubber. It is scheduled to

become a multi-billion Euro public company next year. Bayer Advanced Materials contains the remaining products from the former Bayer Plastics unit.

2. Machinery. Krauss-Maffei displayed a monster D-LFT molding system (it looked to be the size of a small diesel locomotive!) with a 1000 ton clamp, molding VW Touareg front end assembly weighing 3.5 kg, made out of black polypropylene and 30% glass fiber that was compounded on an overhead-mounted twin-screw extruder and molded inline. Cycle time was 60 seconds.

Dieffenbacher displayed parts made by its D-LFT process, which competes directly with GMT, by producing fiber reinforced thermoplastic preforms, custom-designed to specific parts that are then made by compression molding. There are 17 of these systems in use in Europe today, almost all for large, relatively flat automotive parts, such as floor pans and front ends. The process can produce preforms with varying thickness to increase strength in areas of the finished part that are expected to bear increased stress.

Milacron exhibited a two component press with two Foboha spinning cubes inside doing in mold labeling and assembly. The cube on the fixed side of the machine is injecting a red PP homopolymer to make a round lid about 2.5 inches in diameter while the cube of the moving side of the machine is injecting a black Pp to make another smaller lid with an in mold label. Where the two cubes meet, the lids are pressed together and the black lid is snap fit to the red lid-in effect a lid within a lid (The product is a lid for chewing tobacco).

Three extruder manufacturers formed an alliance to develop and market twin screw compounding extrusion machines that will be manufactured in China. Najin Ruiya Polymer Processing Equipment Company, Century (Traverse City Michigan) and Extricom GMBH are the three companies and claim they will be able to manufacture the units at 40-50% of the cost of North American and European similar throughput models. Coperion also introduced its Global compounder- supposedly sourced globally- to provide a lower cost unit for twin screw compounding.

3. Materials. Bayer and Ticona both displayed sound speaker systems made of polymeric boards that could be part of an automobile interior or even hung as pictures are on the walls of a house. Bayer used polyurethane sounding boards as the basic material; Ticona used COC sheet combined with woven polypropylene sheets. These novel applications have interesting volume potential and are symbolic of where the emphasis is currently being placed by polymer producers' R&D.

Sulfone polymers were another feature at K, with both Solvay Advanced Polymers and Gharda Chemicals (India) showing new "super" polysulfones. Solvay's "Supradel HTS" was said to have a T_g of 255°C. Gharda's "Gafone T-PSS" (high temperature) offers a T_g of 265°C and a continuous use temperature of 240°C; "Gafone B-PSS" (super tough) offers an Izod impact of 7.1 KJ/m².

In polyolefins, Total Petrochemicals announced a new generation of metallocene medium density PE products developed for rotational molding. A major use for this new technology is rotational molded fuel tanks for automotive, maritime and lawn and garden markets. The new material has enhanced permeation resistance to gasoline but without requiring a coating or second polymer layer for most markets; California air quality regulatory requirements can be met by a construction that combines Total's mPE with a layer of Arkema's Rilsan Nylon 11.

Rhodia announced several new Nylon products designed for High productivity- longer flow- for improved cycle times.

In our December issue we will cover more highlights from the K show...

POLYMER MARKETS

Home Furnishings

Mike and Maaïke (product designers) have developed a novel pillow that uses DuPont™ Hytrel® thermoplastic polyester elastomer. This product design earned them an honorable mention in I.D. Magazine's annual design review. Hytrel® offers a unique mix of properties – flexibility of rubber, soft touch and the strength and ease of processing typical of thermoplastics.



"The pillows are a balance between structure and flexibility that require a versatile material like Hytrel®," said Mike Simonian of Mike and Maaïke. The flexibility of Hytrel®, combined with its warm tactile properties, allow it to replace conventional foam/spring construction in upholstery and cushions. In fact, the cushions push the favorable properties of Hytrel® to their limits, offering a balance between structure and flex and human ergonomics. By using Hytrel®, rather than the fabrics and foams used in conventional pillows, the Thermoplastic Pillows gain unique properties: indoor/outdoor use (all seasons), breathability and stain resistance.

Using the most desirable characteristics of high-performance elastomers and plastics, Hytrel® offers high resistance to creep, impact and flex fatigue; flexibility at low temperatures; and good retention of properties at elevated temperatures. Hytrel® is featured in a number of products other than pillows, such as vent hair brushes, Saucony® running shoes and avant garde fashion items such as the Brani® Belt, a "best of category" winner in I.D. magazine's 2002 Annual Design Review.

The DuPont oval logo, Hytrel® and DuPont™ are registered trademarks or trademarks of DuPont or its affiliates. Brani® Waistware belt is a registered trademark of The OrangTiga Company NV.v Saucony® is a registered trademark of Saucony, Inc. **Source:** DuPont

Construction – Heating systems

In terms of replacing metal components by innovative plastic products, the automotive industry is usually the market that is the precursor. Such a development has now come from the world of heating technology. In cooperation with the custom molders Wilden AG, Nefit Buderus, a subsidiary of Bosch, has developed a complete hydraulic assembly group with a groundbreaking modular design for a gas-fired boiler system.

In addition to the dialog with material producers, this provides the required confidence for realizing the assembly for a conservative target group - both service technicians and customers must be convinced of the advantages when a new technology enters the market. From a technical point of view, the given objective was highly sophisticated. After all, the components must be capable of operating 24 hours per day for a life-span of at least 15 years. This was one of the reasons for Nefit Buderus to choose Wilden AG as a partner for the realization of this project since Wilden has gained far-reaching experience in precision plastics components in the automotive sector.



Assembly group Hydraulic Assy

Groundbreaking concept with modular design

The assembly group consists of nine parts in total which are application-specifically assembled at Wilden in Buinen and integrated into the gas-fired boiler. The great range of combinations provided by the individual components results in maximum application flexibility while being highly cost-effective at the same time. Depending on the boiler version, the Hydraulic Assy is available with or without hot water functionality.

The realization of the Nefit Buderus concept sets standards on all levels. Simultaneous Engineering of the various assembly combinations ensures efficient construction processing. Flexible assembly options of the hydraulic assembly group facilitate a short response-time to orders received by the customer. Finally, the heating system technicians benefit from simplified installation and service conditions - now the components are joined using a plug connection and then secured with a metal clip. Previously they had to be welded or soldered using costly pipe solutions.

This modular concept is also retained on production level. The molds have exchangeable cores in order to allow a variable insertion of openings.

Wilden AG accompanied the development of the Hydraulic Assembly up to maturity phase. The involvement in the project at a very early stage ensured a good design from the beginning. By means of moldflow and finite element calculations, optimum sprue positions were determined in order to ensure a minimized stress ratio and low warpage. Models for fluidic and thermo-technical analyses were produced for Nefit Buderus through Rapid Prototyping.

A range of requirements was taken into account for the plastic design. A further significant requirement for the plastics-adjusted realization was the compensation for strains and tensions during assembly and for possible permanent tensions that could affect the components due to an inaccurate installation of the pipe systems. Wilden AG undertook the dimensional adjustment of all parts, whereas Nefit Buderus performed functional and endurance tests as well as practical and laboratory tests under extreme conditions.

The Nefit gas-fired boiler was first launched in Great Britain in July 2004 because the British market is especially suited for a compact and flexible system which facilitates an easy installation for new buildings with a small living area and retrofitting for older buildings. Italy, France and Turkey are the next countries where the product will be launched since their markets are structured similarly.

Nefit Buderus B.V., with headquarters in Deventer Netherlands and a subsidiary in Buinen, is a company subsidiary of the Buderus Heiztechnik AG since 1994.

With thirteen plants and branch offices in Europe, the USA and Asia, the Wilden AG is counted among Europe's largest injection molding companies.

Source: *Wilden AG*

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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 News* and newswires.

PolymerPlace.com

<http://www.Polymerplace.com>

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