

PolymerPlace Notes
A plastics technology newsletter
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The SPE annual technical meeting (ANTEC) is held in Nashville, TN this year. It is scheduled May 4th through the 7th. Two of the principals of Polymerplace will be presenting papers in the Marketing and Management Session on May 5, 2003.

The May 5th schedule.

1:30PM: Decision Tools for an Enhanced Supply Chain -**Margaret Baumann**, GH Associates & Carol Vesier, RonaMax, LLC

2:30PM: Speed and Flexibility: A Value Proposition for a New Competitive Plastics Industry Environment—Norman fFwler, Xerox Corp.

3:00PM: Nylon Polymers Industry Undergoing Major Changes **Roger Jones**, Franklin Management International

3:30PM: Injection Molding Design & Development Decision Support Technologies—Anne Bernhardt, Plastics & Computer Inc.

4:00PM: From Russia with Respect—J. L. Spoonmaker, Spoonmaker Consulting

4:30PM: Structured Product Definition—David Anderson, DMAjic Consulting

The Marketing and Management ANTEC 2003 program will cover ideas to improve your profitability, suggest means to improve your product development cycle and analyze the Nylon and Russian polymer markets. One theme that resonates in all of our papers is the increased level of competitiveness in the polymer markets. Our goal is to offer you some ideas to improve your market position.

Our first paper is a keynote paper by Margaret Baumann of G.H. Associates and Carol Vesier of RonaMax, L.L.C. entitled *Decision Tools for an Enhanced Supply Chain*. This paper explores methods to identify the most profitable use of capital equipment, setting inventory levels, scheduling production and setting the direction for future capital investment.

Norman E. Fowler of Xerox Corporation paper, *Speed and Flexibility: A Value Proposition for a New Competitive Plastics Industry Environment* is our next paper. Norm's paper discusses market life cycles and how to improve a product "speed to market" to maximize a company's profitability.

Roger F. Jones of Franklin International, LL.C. paper is *Nylon Polymers Industry Undergoing Major changes*. Roger analyzes the Nylon Polymer world wide markets including the history of the polymer and current market conditions. Roger uses the history and market conditions to explain the actions of the suppliers of Nylon resins.

Anne Bernhardt of Plastics & Computer Inc. will present *Injection Molding Product Design and Development Support Technologies*. Anne reviews product development life cycles, the importance of communications in the product life cycle and software to automate and speed the product development process.

J. L. Spoonmaker of Spoonmaker Consultancy presentation is entitled, *From Russia with Respect*. This paper reviews institutions doing research on polymers.

If you are attending ANTEC, we hope you will come to the session.

On June 25, 2003 we will also be speaking at the NPE conference sponsored by SPE and SPI. The conference is part of one of the world's largest trade shows, The National Plastics Exposition (NPE 2003) which is held at McCormick Place in Chicago, Illinois from June 23-27, 2003. The sessions held during show hours are free to attendees. Roger Jones will be speaking on "Managing in Turbulent Times". Maggie Baumann's presentation is on "Optimizing the Supply Chain". Both presentations are in the Business Management Session. For more information on the conference and the tradeshow please visit, <http://www.NPE.org> or <http://www.4SPE.org>.

In addition to the free conference there are seminars provided by SPE on a variety of topics. Payment is required for the seminars.

On April 27-29th we attended the **Commercial Development and Marketing Association Spring Meeting** in Boston. The Commercial Development and Marketing Association is the merger of two organizations that have served the Chemicals Industry for over 50 years, the CMRA (Chemical Marketing and Resources Organization) and the CDA (Commercial Development Association). The meeting topic was "Visualizing the Future: Are you in it?" One of the highlights of the meeting was a panel discussion among financial analysts about their prognosis for the chemicals industry. There was also a panel discussion by a group of Chemical Industry CEOs/Presidents. This group included Carl Jennings who is the President of BASF Americas. Key challenges to the industry discussed included the growing competitiveness of the chemicals and polymers industries, overcapacity, sluggish growth the need for growth strategies and innovation.

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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 http://www.amazon.com/exec/obidos/tg/detail/-/1566768837/qid=1040144616/sr=1-17/ref=sr_1_17/002-2326067-7891213?v=glance&s=books.

We've been showing highlights from each chapter in our monthly newsletters. This issue will cover **Chapter Five – Managing for Success**. This chapter starts with a description of what business plans should consist, how they are constructed, and how they should be implemented. The importance of sticking to basics is emphasized, as well as the need to provide plans for when there are deviations from plan, either up or down. Next, how to manage and integrate the various functional business components of the company's organization into effective teams is described, noting that too many companies centralize rather than integrate decision making and authority within their structures. Then, the most effective use of each functional group is explained, together with how to have them work together in teams. The functional groups include R&D, Sales & Marketing, Manufacturing (including supply-chain management), and Administration (such as Human Resources, Credit, Legal, and Finance). Finally, the role of cost cutting is analyzed, with a discussion of the limits of this popular management tool.

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Resin Pricing....UP?

Crude oil prices are still very volatile because of the Venezuela oil workers strike earlier this year and all wells are still not back in full production. The loss of crude oil production in Iraq is still a problem in world oil markets. Full production is not expected to return until 3Q03 at the earliest. This will keep crude prices high (currently \$30/bbl) once these markets stabilize in 3Q03, we expect price to retreat to about \$25/bbl.

The Natural Gas liquids (primarily ethane, which is a major feedstock for US steam crackers) market is still quite volatile because of the very tight market in 1Q03 with prices spiking in March. Prices have come down to around \$5/ million cubic feet from \$9/mcf. Prices last year were in the \$3 range. A consultant that watches this market is forecasting 2003 NGL prices will average about \$4.40/mcf. The Natural gas market is expected to remain tight through 2004 when additional distribution facilities come on line.

These high crude oil and ethane prices will force ethylene prices upward, which in turn are forcing polyethylene, polystyrene and polypropylene prices upward. Also forcing polymer prices upward has been the lack of profitability in the marketplace over the past two years. Polyolefin Producers are now trying to regain some sort of profitability to their business. This will result in higher polymer prices in 2Q03 and 3Q03. On the negative side, are low polyethylene film and injection molding prices for imports coming in from South East Asia because of the buildup in polyethylene capacity in the Middle East. PE film imports were about 1200 K ton in 2002. This was business lost by US extruders. Through Polymerplace you can access a monthly newsletter which reviews issues regarding volume polymer supply, demand and pricing by Bill Kuhlke of Kuhlke and Associates.

http://www.polymerplace.com/articles/overviews_kuhlke.htm

The situation for engineering plastic suppliers is a little different. Although raw material costs and energy prices have also increased dramatically the biggest issue facing the engineering plastics suppliers is capacity utilization. After a reasonably healthy January and February, March and April sales have been depressed. This has dramatically reduced capacity utilization making it very difficult to pass on the planned price increases. The market is accepting about half of the planned increase.

It is generally believed that demand will not pick up until the 3rd or 4th quarter which will keep pricing relatively flat. However we do not expect any further deterioration in engineering plastic material pricing.

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Polymer Markets

Transportation

Mark your calendars for the Auto Interiors Show - May 13-15th to be held at Cobo Hall in Detroit.

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To produce energy, internal combustion engines burn a mixture of air and fuel. In the past, this fuel-air mixture was created in a carburetor, compressed in a cylinder, and then subjected to a spark to get things moving. Current engines are fired via fuel injection technology. The piping system, the route that delivers fuel to the injectors, is called a fuel rail. This part consists of a pipe with an inlet port, an outlet port for each cylinder and suitable mounting brackets.

Piping systems were traditionally fabricated in metal. The process of manufacture was rather complex. First, each individual subcomponent of the part had to be cast and then brazed together. This method was time consuming, expensive and did not always yield the best quality.

The automotive industry has been looking for ways to provide better quality solutions at a lower cost. **Fuel rails made of Fortron® PPS** (manufactured by Ticona) are lighter, much less expensive and easier to produce than their metal counterparts. The excellent dimensional stability provided by these rails enable a proper fit without leakage.

The grade Fortron® PPS 1140L4 is a stiff, durable, high-performance resin that is an excellent candidate for underhood applications dependant on high-temperature capability. The linear PPS polymer in Fortron 1140L4 is less brittle than many other high-temperature resins.

It is highly resistant to standard gasoline or other fuels that contain alcohol, ether and/or nitro compounds and automotive fluids. The smooth surface finish, which facilitates a good fuel flow and delivers uniform pressure at the injectors, prevents turbulence and cavitation.

For more information visit: <http://www.Ticona.com>.

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Material Developments

Victrex® PEEK™ polymer replaces metal in electrical connector coupling nuts

To meet the need for a cost-effective alternative to metal coupling nuts used in electrical connectors, Technique Engineering, Inc., of Lake Forest, IL decided to **injection mold the threaded nuts using VICTREX® PEEK™ polymer, a high performance thermoplastic**. The polymer was chosen for its outstanding combination of properties including chemical resistance, high temperature resistance, toughness and strength.

"VICTREX® PEEK™ polymer has proven to be a cost-effective replacement for metal nuts that must be machined one at a time and which may require secondary finishing operations," says Rudy Avramovich, owner of Technique Engineering. "The polymer exhibits better resistance to chemicals than stainless steel, and because the fittings can be injection molded instead of machined, they are much more cost effective. Fittings such as nuts are easier to manufacture out of PEEK™ polymer as each nut can be molded to exact dimensions every time. In addition, we can supply the polymer nuts in a wide variety of colors whereas metal nuts have a very limited color selection."

Electrical connectors are used in a variety of industries. "When connecting cables and wires in the food industry, corrosion resistance is a major requirement," says Avramovich. "For example, the coupling nuts must be able to maintain their mechanical properties in harsh chemical washdown conditions. VICTREX® PEEK™ polymer can withstand an extremely broad range of chemicals even at elevated temperatures."

"The polymer is extremely tough and has excellent impact resistance and fatigue strength over a wide range of temperatures," adds Avramovich. "It retains good mechanical properties at elevated temperatures"

Technique Engineering Inc., specializes in plastics product manufacturing and plastics tool design. For more information on Victrex, visit <http://www.Victrex.com>

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Rhodia, The Lyon, France-based supplier of nylon resins has introduced a family of polyamide/ABS alloys said to possess a unique combination of impact strength, processability, and low weight. Other new products include a series of halogen- and red phosphorus-free flame retardant polyamides for the E/E market. For more information, visit www.Rhodia.com.

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Process Developments

Spirex Corporation, the exclusive worldwide manufacturer of Twinshot™ Systems, reports that acceptance of the [innovative co-injection technology](#) is growing rapidly among injection molding equipment OEMS.

Van Dorn Demag became the first OEM, this past year, to incorporate the Twinshot multimolding technology in new machines, from its Cadence Series to its large tonnage Caliber Series. Van Dorn Demag's Molder Action Network will also utilize the Twinshot system.

Negri Bossi, another machinery OEM, has announced that it will make the multimaterial molding system available on all their new injection molding presses.

Toshiba Machine has also agreed to make Twinshot™ available on all its hydraulic and electric injection molding machines.

The Twinshot™ process enables a conventional machine with a single barrel and screw to inject two materials in one operation, with one material totally enclosing the other. Plasticizing occurs on the single screw with a two-stage design. Starve-feeding controls the ration of materials in one or both of the screw stages. Materials can be commodity resins, engineering resins, or a combination.

The Twinshot technology allows the molder to simplify his coinjection equipment requirements, eliminate the need for additional space and reduce the cost of manufacturing."

Among the reported benefits of the Twinshot™ process is its ability to:

- • Encapsulate low cost material, including off-spec, regrind or recycled material with up to a 30% savings on material costs.
- • Encapsulate foamed material, thus reducing sink and warp and improving strength-to-weight ratio.
- • Produce soft touch parts in a single molding operation.
- • Encapsulate reinforced materials within a cosmetic surface.
- • Easily convert to single-material mode, by simply supplying the same material to all feeder hoppers.

For more information about Twinshot™ Systems, Process Optimization, or any Spirex product or service, contact Mark Colella, Vice President of Sales, Spirex Corporation, 8469 Southern Blvd., Youngstown, OH 44512, USA. Phone: 330-726-4000; Fax: 330-726-9437; or Email: sales@spirex.com. Website at: <http://www.spirex.com>.

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Ease of use is a key determinant of a product's mainstream success. Trexel has long understood this point and has focused its engineering program on the objective of global mainstream adoption.

As discussed in a recent Polymerplace newsletter. The recently introduced MuCell Modular Upgrade represents an extraordinary advance for the technology as [nearly any injection molding machine can now be converted to a MuCell Injection molding machine](#).

The Upgrade, which can be installed at the customer's facility within one week (allowing, of course, for lead time in screw manufacture), was enabled by the replacement of the original 28:1 screw design with a 22:1 design. This allows direct replacement of current screws and barrels without complex and costly mechanical adaptations. Testing has proven that the 22:1 screw creates no compromise in the ability to make microcellular parts.

The following are some commercially successful applications using the Mucell Process

Jyco Sealing Technologies, Inc., a Trexel licensee, has established a business converting automotive weatherstrips or sealing systems from EPDM rubber (ethylene propylene diene monomer) to TPV (thermoplastic vulcanizate). In 2001, building on its many years of industry experience, Michigan-based Jyco started to produce microcellular-foamed and solid TPV seals.

Jyco licensed the MuCell Extrusion Technology after thoroughly evaluating traditional processes such as chemical and water foaming. The foaming process is critical as an open-cell structure prevents them from meeting the stringent automotive requirements. The MuCell process, which uses supercritical fluids, gives us better control over cell structure. They are able to achieve a closed cell structure that keeps moisture out and a consistent surface finish.

TPVs are rapidly replacing EPDM due to their advantages in recyclability, part cost reduction, colorability, and durability. Multi-component weatherseal profiles, such as door and trunk seals, often require a high performance foam element. It is for these reasons that Trexel has applied its microcellular expertise to the development of a robust TPV foaming process and to the screening and testing of appropriate TPV formulations.

As of December 2002, Genesis Plastics & Engineering, LLC (Indiana) has qualified and started production of its first two MuCell business equipment applications. Both parts are made of a glass-filled engineering resin and require tight dimensional tolerances, which is a common requirement for most printer components. Analysis of critical functional dimensions on these parts showed that the MuCell process not only maintained, but also, improved the process capability index (CpK) compared to solid molded parts. Genesis' experience with other MuCell applications, including a Tecumseh fan, also showed an improvement in the CpK value. The improved dimensional tolerances are attributed to the lower stresses inherent with the MuCell process. Besides improved quality, the MuCell process enabled reduced part cost through controlled material reductions and increased productivity through lower cycle times.

As a QS-certified custom injection molder, Genesis services industries that require precision molded parts, such as printing and imaging, electronics, and automotive.

Visit Trexel at <http://www.trexel.com> and at NPE at booth #3038 South.

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.

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