



# **SOCIETY OF PLASTICS ENGINEERS BLOW MOLDING DIVISION**

Spring/Summer 2004 Issue

## **FREMONT PLASTIC MOLDS BRINGS TECHNICAL PROWESS TO THE BLOW MOLDING INDUSTRY**

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*written by:*

**Virginia Joseph**  
**Marketing & Finance Manager**  
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Above: Photo of part with pinch moved to under side utilizing HPT

As the Blow Molding Industry continues to evolve through innovation, Fremont Plastic Molds (FPM) is driving to bring technological prowess to the blow mold tooling and blow molding industries. This drive for technical expertise and advancement, in conjunction with the desire to surpass customer expectations, has lead to the development of their patented Hidden Pinch Technology (HPT).

HPT, which started as an engineering idea, has developed into a whole new way of manufacturing parts that require a first-rate appearance. In conjunction with FPM's engineering precision, Hidden Pinch Technology allows blow-molded parts to be manufactured with flash seams located in inconspicuous locations. This revolutionary design allows high show parts to maintain their appearance while improving manufacturing efficiencies. With the flash seams in an unobtrusive area, the deflashing process can be accomplished more quickly without concern about ruining the appearance of the part. Imagine being able to manufacture a high show part that does not require time consuming trimming procedures to maintain appearance!

In addition to Hidden Pinch Technology, FPM also offers molds manufactured utilizing In-Mold Finishing (IMF). FPM has licensed this technology from Progressive Components in Wauconda, ILL, the current owner of the patents. Extrusion blow molds capable of IMF are manufactured with mechanical knives integrated into the mold. One of the advantages of these automated molds is that the knives required to cut, trim and deflash parts, are removed from workers' hands. This benefits customers by lowering costs through reduced injury rates, increased throughput, and improved accuracy. In addition to cutting, trimming, and deflashing parts, in-mold guillotines can be used to remove domes and slice off redundant features in molded parts. Not only does this improve manufacturing efficiencies and enhance the quality of finished parts, but also as Martin Cass, President of FPM, points out "IMF tooling brings the blow molding industry another step closer to automation." Utilization of IMF dispenses with secondary finishing of technical parts, which can be slow and cumbersome because of the inaccessibility of external cutting points. Expensive nesting fixtures for post-mold finishing of large, technical parts may also no longer be required. Mr. Cass says prototype IMF tools are already in development. An example is for automotive washer bottles where two containers are blow molded in a mouth-to-mouth configuration, in one cavity, and are separated during ejection.



Above: Photo of Martin Cass (left) receiving recognition from Bob Taft, Governor of Ohio, for the 2002 Ernst & Young Entrepreneur Award

*continued on page 9*

## Chairperson's Message



### Welcome to The Spring/Summer 2004 Newsletter

Change is good, isn't it? I will complete my term as Chairman at the ANTEC meeting this month; Ron Puvak (a very capable person), will be taking over. Our Board is changing; we have many new people eager to take on the work of the Blow Molding Division.

Welcome aboard to three new Blow Molding Division Directors; Robert Fitch of Exxon Mobil, Craig Hasselberger of Progressive Components, and Surendra Agarwal of Kraft Foods. If you are interested in meeting new people, learning more about blow molding, donating some of your knowledge to our industry, or just general networking, consider joining our group as a Director or active member. You can contact any member listed on the back of this newsletter for more information.

I have been active with this Division for 15 years and I can't say often enough; the people and contacts you meet by working with SPE are worth every minute. There are upwards of 250 years of Blowmolding experience on the Board at any one time, this is a valuable resource to have access to. Our ask PIP (person in plastics) is a program to help Blowmolding Division and SPE members with questions. Some of the questions are very basic and easy to answer, others are looking for contacts and it's just a matter of introducing people with one another. It's another resource for you, our members to use.

This fall, Sept 22-23, our Annual Blowmolding Conference will be held at the Industrial Materials Institute in Montreal Canada. A latest addition to the program is a discussion on doing business in China, entitled "China's Manufacturing Market: Menace or Opportunity." Late in September, Montreal is a very good reason to stay and enjoy one of the best cities in North America. See our Website for full information.

During the last 15 years we have awarded over \$160,000 in Scholarships to students in Plastics Programs at university. I have read most of the resumes of the applicants and realize there is a really good pool of talent out there for the future of Blowmolding.

Change is good, let's just keep going!

Sincerely,  
Bruce Thompson  
Chairman, Blowmolding Division, SPE

## Understanding Blow Molding Seminar

Plastics USA  
McCormick Place East - Chicago, Illinois  
September 28-30, 2004

*Instructor: Norman C. Lee*

### Purpose & Overview

This course is intended to provide an understanding of the blow molding processes. Including: Extrusion blow molding both continuous & intermittent, injection blow & stretch blow, multi-layer & 3d molding plus factors that affect the profitability of the operation.

### Who Should Attend?

This program is intended for those new to the blow molding industry and experienced who wish to become knowledgeable about blow molding. Technical Engineers, Designers and Marketing Product Managers and those aware of blow molding technology, will find this seminar valuable for consideration of applications, new markets and evaluating the potential of Blow Molding parts.

### Seminar Content Plastic Blow Molding

- History • Summary of Development • Range of blow molding products

### Blow Molding Process

- Blowing techniques • Parison programming • Accumulator heads • Understanding the extruder • Part weight and wall thickness • Cycle times • Introduction to head tooling • Maximizing yields

### Understanding Molds

- Main characteristics • Mold materials • Cutting and weld lines • Pinch-off area • The blow pin

### Understanding Materials

- Necessary properties • Parison shrinkage • Processing problems • Mold contact/cooling • Parison stretch

### Basic Part Design

- General variations • Guidelines for radii • Draft angles • Blow Ratio • Layout • Design for bottles/industrial parts

### Decorating Blow Molding Parts

- Surface treatment • Screen printing • Spray painting • Hot stamping • Labels

### Other Blow Molding Processes

- Injection Blow Molding • Multi-layer • Stretch blow • Continuous Molding

## HOW TO REGISTER:

### Register On-line:

Go to [http://www.4spe.org/forms/pusa04seminar\\_reg.htm](http://www.4spe.org/forms/pusa04seminar_reg.htm)

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ASK US

Bruce Thompson  
Chairperson  
at 952-556-1893 or  
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[bruce\\_thompson@entegris.com](mailto:bruce_thompson@entegris.com)

OR

Any of the Board of Directors listed on the back of the Newsletter

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609-368-7229

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# BOARD OF DIRECTOR'S MEETING

*Minutes of the Board of Directors of the Blow Molding  
Division of SPE, Meeting held at The BPSolvay Technical  
Center, Deer Park, TX. , ??? DATE???*

## ❑ Executive Meeting:

The mandatory safety film for all visitors to the Tech Center was shown at 08:00.

## ❑ Call to order 8:25, Bruce Thompson, Chairperson

- BOD Members present: Bruce Thompson, Ron Puvak, Robert Slawska, W Burrington, Mark Heitker, Robert DeLong, Jon Meckley, Mark Barger, Lew Ferguson, Dave Holliman, Tim Noggle, Robert Jackson, Joe Altimari, Gary Carr, John Rathman, Gordon Williams, Rainer Farrag, Jack McGarry, Karim Amellal, Janai Stepp
- BOD Members Excused: Robert Gilbert, Robert DiRaddo,

## ❑ TPC Meeting – J. Meckley

- We are looking to acquire a credit card machine to make payments easier for conferences. ABC 2004 in Montreal has access to a machine.
- We made \$8832 from the ABC 2003 conference.
- The Web site should be operational by the week of February 15<sup>th</sup>. There were 5,590 hits.
- A list of possible speakers was requested. Potential speakers should be sent a copy of "Speaker Guidelines" to help them format their speeches.
- The Board meeting during the ANTEC will be changed until Wednesday, May 19<sup>th</sup> from 12:30-5:30 PM
- Future ANTEC Conference Chairperson: 2005 – Boston, Mark Barger; 2006- Charlotte, Jon Meckley; 2007 – Cincinnati, Jon Meckley; 2008 – Milwaukee, TBD.
- Proposal for 2005 meeting in Toledo; October 11-13 at the Seagate Center (R Puvak coordinating. Discussion of revenue sharing in Toledo vs. Troy. Target is to work with local Section.
- Vote for 2005 ABC Conference: Toledo or Troy; Unanimous for Toledo.
- Bob Jackson offered to be the coordinator for the 2006 ABC Conference in Troy.
- 2007 meeting is open; suggestions were for Graham, York, PA, Michigan State University, East Lansing, MI.

## ❑ Tour of BPSolvay Technical Center 10:00-10:30 with Mark Heitker

- The BOD members were treated to a very nice tour of the Solvay Technical Center.

## ❑ Councilor's Report/Discussion by Bob DeLong

- SPE has been promising last 3-4 years as break even, didn't happen.
- ANTEC, typically generates \$400,000 but due to SARS and war in Iraq, barely broke even.
- Staff cuts at SPE, 51 to 30 people. Proposed fiscal controls, seminars not profitable, magazine expenses high.
- SPE asking Divisions and Sections for rebate.
- New Executive Director to be announced at ANTEC.

### ACTION ITEMS:

1. *GMG donation for Workplace Scholarship Program needs better definition – assigned to Tim Noggle.*

## ❑ Nominating Committee Report by Bruce Thompson

- Proposed slate for election presented, unanimous.
- Joe Altimari will accept the Chair – Elect position.
- John Rathman will accept the Finance Chair position.

## ❑ Awards Report by Dave Holliman

- Lifetime achievement awards were supported for Michael Ryan and Bob DeLong. Ed Nairnes was held back for next year.
- Honored Service award was supported for Ron Puvak.

## ❑ Membership Report by Lew Ferguson

- Total membership is 960 including 322 secondary members
- Invite the SPE to be a "Table Top" exhibitor for recruiting new members.
- Lew will compile a "New Board Member" kit for each of our members.

### ACTION ITEMS:

1. *Lew Ferguson to investigate discounted membership at ABC through the SPE. This was offered by Jenny at last ABC.*
2. *Budget should be increased to cover additional mailing and recruitment costs.*
3. *There were two write-ins from last election. Robert Fisch & Randy Wiser. Lew to contact them.*
4. *Lew to contact National on additional recruitment tools that we can use.*

## ❑ Newsletter Report by Bob Slawska & Tim Noggle

- Still having problems coordinating and getting sponsors. Need \$12000 for Newsletter.
- Emma will send letter to previous advertisers to find out current interest.

### ACTION ITEMS:

1. *BOD members need to promote sponsorship which will help newsletter*

## ❑ TPC report – Jon Meckley

- Volunteers are needed to review student papers. One of the new duties of the TPC Committee is to review these papers. They will come into the committee and be routed to the appropriate person for review.

## ❑ Education - Mark Barger

- Submissions for Scholarship are down this year, normal 10, this year 4.
- Recommended to join National's Scholarship program to reduce administrative duties, and review candidates. Unanimous to join for a 5 year commitment, advance money one year at a time.
- Discussed four submissions for Student Design Competition.
- No activity for Workplace Scholarships yet.

## ❑ Marketing – Ron Puvak

- Open Chair – need volunteer.
- Propose Sponsor system for entire Division activities. Present at ANTEC.
- Web site is doing very well, over 5000 hits, will keep monitoring.
- Need content for Web site.

### ACTION ITEMS:

1. *Have next steps in the sponsor plan completed by ANTEC. – R Puvak.*

### OLD BUSINESS:

- Volunteers for design contest – Dave Holiman, Bob Slawska, Robert Dirrado
- Need everyone to be active on two committees.
- Define Administration Assistant's job duties and scope. Bruce and Ron to complete.
- Do we want to still have BOD Meetings at ANTEC? For now, yes.
- Motion: Does the BOD formally declare that the scholarship grant funds be dedicated ONLY to this type of disbursement? Tabled.
- Motion: The board authorizes the Chairman to obtain a review on how the scholarship funds can best be protected for the desired purpose. Tabled.
- Bekum would like to be recognized in the newsletter for donating a Blow Molder to Ferris State – Will be added to the next addition.
- Do we want to add job listings on the web site? Will be added to part of the Web site plan/work areas. Under investigation.
- We need volunteers to collect the scholarship funds. These are also needed for existing newsletter ads. Suggestion that the BOD members divide up the list and call them. It would be a small number. Bob DeLong will send out the list.

**ADJOURNMENT: Motion to adjourn - adjourned at 4 pm**

## Keeping-Up with Blow Molding

*A Plastics Technology Online Article*

### Clock Ticking on Machine Safety Standards – 03/04

A three-year countdown to compliance with new worker-safety standards from the American National Standards Institute, NYC, has begun for owners of injection-blow and extrusion blow molding machines. The ANSI B151.15-2003 standards were adopted and published in September (for injection-blow) and October (for extrusion blow), setting deadlines for full compliance by the same month in 2006. These standards detail ways to meet OSHA's general safety requirements for these machines.

"ANSI standards provide a roadmap to best industry safety practices," says Walt Bishop, director of SPI's Machinery, Molders, and Moldmakers Divisions, which developed the standards with ANSI. The standards indicate how to fulfill requirements to protect operators from mechanical, thermal, and electrical hazards. They describe essential safety interlocks, mechanical guards, digital relays, and redundancy techniques. Industry sources estimate that of the 8000 or so extrusion and injection-blow machines in the US, about half do not yet fully comply. New machines have been built to meet the standard for some time now, and OEMs offer packages for bringing older models into compliance. The estimated cost is \$10,000 to \$25,000 per machine.

Though the ANSI standards are "voluntary," Bishop calls them "reference points" for OSHA inspectors as well as for legal authorities pursuing liability actions. Copies of the standards cost \$42 from Global Engineering Documents, div. of HIS Engineering, Englewood, Colo.

Dennis Aulbrook, president of American Safety & Equipment in Oxford, MI., says his company can take much of the hassle and cost out of retrofitting the mixture of machine brands typical in most shops. Aulbrook says ASE can retrofit all machines in one shutdown.

Tel: 866-522-2300 , [www.americansafetysafetyequipment.com](http://www.americansafetysafetyequipment.com)

## SPE BLOW MOLDING DIVISION Receives 2004 PRIDE Award

The Pride Award stands for Performance Review for Individual Divisional Excellence.

It was established in 1987, the PRIDE program is a means for Divisions to evaluate the programs and services they provide to their members, other Divisions and Sections, and the plastics industry.

Criteria forms are sent to all Divisions each year to enable them to report on their activities in areas such as ANTEC programming, topical conference programming, collaboration with Sections regarding technical meetings and events. These events include: educational opportunities and scholarships, finances and administration, work with students and the general public, and participation in various Society-sponsored events and contests. Divisions who meet a specified number of criteria receive an award at ANTEC each spring.

### Congratulations, Blow Molding Division

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## CAPPELLETTI & TONER AWARDS ESTABLISHED

Over the past year, SPE Past President Norm Fowler watched as two long-time employees of SPE retired within a six-month period. Norm decided that these two gentlemen – Executive Director Mike Cappelletti and PR Director Jim Toner – should be honored in a special way. He chose to establish two new awards within SPE: The James Toner Service Excellence Award and The Mike Cappelletti Leadership Award. The first awards were presented at ANTEC 2004 in Chicago in May.

### Michael Cappelletti Leadership Award

The Michael Cappelletti Leadership Award was established in 2004 to recognize a significant one-time or sustained demonstration of outstanding leadership within the Society of Plastics Engineers. The Award is open to both the Society's Staff and volunteers. It is awarded annually and is named after long-time SPE Staff member and recently retired Executive Director Mike Cappelletti. This award consists of an honorarium of \$100.

From the presentation speech; "The inaugural recipients of the Michael Cappelletti Leadership Award are President **Donna Davis** and new Executive Director **Susan Oderwald**. As many of you are aware, at the last ANTEC in Nashville, the Society of Plastics Engineers faced serious financial, membership and other challenges. Some of these challenges are unique to SPE, while many are common to other professional societies and associations. With the leadership of both Donna and Susan, actions by the Council and Staff, and support of the Society's sections and divisions, SPE has faced the challenges head on, positioning itself for current stability and future growth.

Through the efforts of Susan and Donna, the Society has begun to see membership numbers stabilize and actually reverse the downward trend. Through tough Staff budget discussions and passionate Council debate, the Society established a budget that will begin to return funds to retained earnings. Together, Donna and Susan led the Governance and Management portions of the Society to face our challenges head on. Together, they are recipients of the inaugural Michael Cappelletti Leadership Award."

### James Toner Service Excellence Award

The James Toner Service Excellence Award was established in 2004 to recognize a one-time or sustained demonstration of extraordinary customer service performance and/or behavior by a Staff member or volunteer, within, or on behalf of, the Society. This award is named after long-time SPE Staff member and recently retired Jim Toner and consists of an honorarium of \$100.

From the presentation speech: "The inaugural recipient of the James Toner Service Excellence Award is **Gail Bristol**. As long as any member can remember, Gail has exemplified extraordinary customer service and support to the Society's Divisions, Sections and Foundation. Her devotion to the membership and the Society as a whole is well documented and appreciated by all who call into International Headquarters with questions, issues or "opportunities." Gail has consistently demonstrated a high regard for the Society's members, customers and her Staff peers. Based on her undying passion for ensuring that every Society member's requirements are met, it's my pleasure to present Gail Bristol with this year's James Toner Service Excellence Award."

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## ON THE LIGHTER SIDE.....

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To the optimist, the glass is half full. To the pessimist, the glass is half-empty.

To the engineer, the glass is twice as big as it needs to be.

### Arguing with an Engineer

Arguing with an engineer is a lot like wrestling in the mud with a pig. After a few hours, you realize that he likes it.

### What is 2+2? Question: What is the sum of 2 + 2?

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A mathematician will say "I believe it is 4, but I will have to prove it."

A statistician will say "The population is too small to give an accurate answer, but on the basis of the data supplied the answer lies between 3 & 5."

An economist will say "Based on today's thinking, the answer is 4 but the answer may be different tomorrow".

An engineer will say "The answer is 4, but adding a safety factor we will call it 5".

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## FREMONT PLASTIC MOLDS BRINGS TECHNICAL PROWESS TO THE BLOW MOLDING INDUSTRY

### continued from Cover

The continued development and perfection of HPT and In-Mold Finishing would not be possible without Fremont Plastic Molds' award winning engineering department. Utilizing the latest technology in CAD software, in combination with FPM's experience in every phase of the mold manufacturing process, the company's engineering team excels in the areas of product development and design, as well as mold design. The engineers' dynamic surface creation, manipulation, and product design experience gives them excellent insights to help assist their customers design a quality part.

Once the product drawing is finalized in the CAD system, FPM's team of design engineers can quickly develop molds that perfectly meet customer requirements. By combining product development and design with mold design, FPM's customers get the best parts, in addition to reduced development costs and increased speed to market. This engineering superiority is exemplified in the SPE Automotive Award received by Fremont Plastic Molds for Body Interior Champion for developing the tooling for the 1999 Jeep Grand Cherokee Load Floor / Spare Tire Cover in conjunction with Lear Corporation. The cover is manufactured using extrusion blow molding where the floor carpet is mechanically bonded to the cover and the carpet perimeter is trimmed during the blow molding sequence.



Above: Photo of awarding winning Load Floor/Spare Tire Cover

Working in conjunction with its highly technical engineering department is Fremont Plastic Molds' large and impressive high speed CNC machining department. FPM utilizes 17 CNC mills to high speed machine some of the most accurate tooling in the industry. This large CNC capacity is optimized with powerful 3D CAM software that creates roughing and finishing tool paths and assures the highest quality machining of FPM's molds and models. To assure that downtime is minimized and productivity is always maximized, FPM utilizes integrated visualization and verification software that allows all tool paths to be checked before they are downloaded to the high speed machining centers. FPM definitely has unsurpassed technical knowledge with the ability to apply it. This technical ability is evident in the development and utilization of HPT and IMF.

To continue to optimize productivity and reduce lead times, FPM has developed a manufacturing system called *shop-trak*. It is an internal, manufacturing database created by Martin Cass to improve productivity and drive standardization for componentry. The database is stored electronically and is accessible from a computer on the shop floor. *shop-trak* looks like a catalog and on each component page, there are links that machinist can use to access CAD drawings, solid models, CNC process sheets, CNC routines and general work instructions; everything a machinist would need to manufacture that specific component. "Standardization is a cultural thing that requires a lot of focus and persistence," says Martin Cass. "The great power of this resource database is that the information can be accessed instantly by the machinist, the project managers access it for part costing, and the design engineers use it as a solid model library." All of these advantages lead to better quality molds, resulting in better quality parts for our customers.

Based on this process of standardizing components, FPM has extended its partnership with Progressive Components and has developed a Standard Parts Catalog. The strength of the parts catalog is that it gives FPM customers access to standard components, so when a mold component wears out or fails; it can be easily and quickly ordered and installed with minimum downtime. Without standardization, customers experience the inconvenience and expense of having custom components re-manufactured when old components need to be replaced. This could be a significant expense and have a large, negative effect on production schedules.

Fremont Plastic Molds' progressive, innovative approach goes beyond engineering and manufacturing procedures and extends to the customer-supplier relationship. The company's dedication to their customer can be seen in their enthusiasm for project management, the on-line mold progress reporting service called *e.trak* and their commitment to providing their customer with a one-stop-shop that provides tooling and all the secondary fixtures and gages required to produce a finished product.

Since 1962, FPM has been building a reputation for honesty, integrity, and reliability. This can be seen in their exemplary staff of project managers. At FPM, the project managers are responsible for the long term, positive relationships that are the company's foundation. Each project manager is an engineering professional that plans and directs the progress of the tooling programs to ensure they are manufactured on-schedule and to a level that exceeds customer expectations.

The customer relationships that have been cultivated by the project managers have been facilitated by the implementation of the on-line mold progress reporting system called *e.trak*. The *e.trak* system is a web-accessible, password protected application that provides FPM's customers with a complete end-to-end on-line scheduling service. The *e.trak* system allows customers to access reports, drawings, photos and scheduling timelines for their tooling projects from initial development and design through to shipment. This provides FPM with an excellent communication tool and gives their customers an innovative, precise, and reliable way to disseminate information within their organizations.

As further service to their customers, FPM has the capabilities to be a one-stop-shop providing complete tooling requirements, including secondary fixtures and gages, required to produce a complete part. The reliability and accuracy of this approach is unmatched in the industry. Once FPM has completed the product design and the mold design, the custom fixtures and gages are professionally manufactured to match customer part specifications. The customer can relax knowing that all the tooling, fixtures, and gages will work together to create the perfect part.

With everything that Fremont Plastic Mold has to offer, the company truly is "Industry's Link to Technology".



Above: Photo of FPM's Secondary Fixture

**Fremont Plastic Molds Member of the Midwest Tooling Group**

# Blow Molding Conference 2004

**When:** September 22-23, 2004

**Where:** Montreal, Canada

The **Society of Plastics Engineers Annual Blow Molding Conference** is the premiere forum for the blow molding industry. This year it will be held on September 22-23 at the Industrial Materials Institute, minutes from downtown Montreal. The focus will be on manufacturing efficiency.



The conference provides a forum for blow molders, resin manufacturers, mold-makers and machinery manufacturers to interact on a variety of subjects.

## Who Should Attend

If you are in production, sales and marketing, R&D or engineering in blow molding or a related field, this conference should be on your "Must Attend" list. Speakers from major players in the field have been confirmed:

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### Materials

Bayer, Nova Chemicals, Voridian, Exxon, Dupont-Dow

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## Topics

Presentations will cover the following subjects:

- Process control and automation
- Manufacturing tendencies
- Design by simulation
- Heating effects
- Micro-blow molding
- Materials advancements for EBM and ISBM
- Workshops on 3XY, multilayer, one-stage ISBM, micro-blow molding

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**Denes Hunkar, 67,  
Honored at Memorial Service**  
**By Bill Bregar**  
PLASTICS NEWS STAFF

CINCINNATI (May 12, 10:35 a.m. EDT) — Denes Hunkar, an expert in process controls and systems who brought computer integrated manufacturing to the plastics industry, died April 28 after an extended illness. He was 67.

Andy Fricke, Hunkar's cousin who worked at Hunkar Laboratories for 28 years, said Hunkar died from several medical problems, including congestive heart failure, kidney failure and several strokes. A memorial service was held May 8 in Cincinnati. Hunkar held a dual master's degree in electrical engineering and mechanical engineering, plus a doctorate in nuclear engineering. He had 10 U.S. and 32 international patents.

He was born in Keced, Hungary, in 1936. After the Hungarian Revolution, he immigrated to the United States and lived in Cleveland and Detroit, before moving to Cincinnati.

Hunkar Laboratories is known for its innovations in plastics process control. But the company's early days are less well-known. In 1962, Hunkar started his company — Hunkar Instrument Development Laboratories — while teaching nuclear physics at the University of Cincinnati. The firm developed new technologies for a diverse customer list, including Abbott Laboratories Inc., Betty Crocker, Procter & Gamble Co. and Mercy Hospital. He developed prototypes for the heart monitor, the CAT scan and the blood analyzer. In a plastics-specific innovation, Hunkar created the

first electronic parison programmer for extrusion blow molding, in 1958. P&G used the programmer to improve production of a bottle for Ivory dishwashing soap.

In 1970, Hunkar decided to focus only on the plastics industry and shortened the company name to Hunkar Laboratories. He sold the rights to his medical applications to Abbott Laboratories.

The company has a long list of innovations, including: the first closed-loop process control for injection molding in 1970, closed-loop hydraulic control technologies in 1976, the first microprocessor-based machine control in 1978 and early statistical process control programs.

Hunkar also was a co-founder of the Society of Plastics Engineers' Blow Molding Division. SPE honored him with the International Award for Engineering and Technology in 1991, and the following year gave him the International Award for Business Management in 1992.

Fricke, who read the eulogy at Hunkar's memorial service, called him "a kind, interesting man who was full of life." As boys in Hungary, their families became refugees during World War II. Fricke recalled he and his cousin caught rabbits and scraped the ground in a potato field to get food, as their families stayed in a war-ravaged castle in Austria. Hunkar showed his engineering talents by making paper airplanes and slingshots from scraps the Germans left behind.

Hunkar sold his company in 1999 because of health problems. He served on the board of directors for about two years, then retired. He pushed plastics technology forward. "People always said that he was always 10-15 years ahead of his time," said Fricke, a plastics consultant in Cincinnati. Hunkar is survived by a son, Nick Hunkar, and daughter, Elizabeth

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