SOCIETY OF PLASTICS ENGINEERS
BLOW MOLDING DIVISION
Volume 2007 Edition 2

Annual
Blow Molding Conference

October 10-11, 2007
Toledo, Ohio

Coming soon, the Blow Molding Division of SPE will be hosting the premier forum for the blow molding industry.

The Annual Blow Molding Conference provides blow molders, resin manufacturers, mold-makers, and machinery manufacturers the opportunity to network and interact while learning about the latest innovations in blow molding technology.

Speakers from 25 companies will cover topics from every area of the blow molding industry.

Look for more details and registration information in this issue.

Chairperson's Message

Hello everyone!

This is my first column as your new chairman. I teach at Penn State Erie's Plastics Engineering Technology program. Although most of our classes are geared towards injection molding, I teach the only class that has some blow molding content. In fact my students would say it isn't a packaging course, it is a blow molding course with some other packaging content added.

The board has been working very hard on this October's Annual Blow Molding Conference. From the program it looks like it will be one of our best. It has many interesting topics. We are again offering two parallel sessions, one in industrial and the other in packaging. There should be something for everyone. Please make arrangements to attend and spread the word to your colleagues.

Although we all see blow molding as the major process in our lives, injection molding takes center stage at most universities. Blow molding is treated as a topic in some courses or there may be one course dealing with blow molding. There are several universities that have blow molding equipment and use them for their classes or research. Although these universities would welcome your donations of equipment, your experience and time would be even more valuable.

SPE Blow Molding Division ANTEC Education Committee Newsletter Report

Memorial Scholarship program:

Our new $8000 scholarship

Russell Ankenbrandt – Ferris State University – Carrie Fox Solin Memorial Scholarship sponsored by ExxonMobil Chemical Co.

Dr. Lawrence Solin presented this scholarship to Russell at the conclusion of our ANTEC blow molding session on May 9th.

Jason Merkle - Ferris State University – John Raymonds Sr. Memorial Scholarship sponsored by Captive Plastics.

Their semi-annual $2000 awards begin in the fall 2007 semester.

Our current scholarship recipients are:

Matthew Gross - Pennsylvania College of Technology – 1st year Carrie Fox Solin Memorial Scholarship sponsored by ExxonMobil Chemical Co.

Daniel Dempsey - Penn State Eire – 1st year John Raymonds Sr. Memorial Scholarship. sponsored by Captive Plastics.

Matthew Loeffler - Penn State Eire – 2nd year Carrie Fox Solin Memorial Scholarship sponsored by ExxonMobil Chemical Co.

Our scholarship program is being managed through the SPE Foundation. Program info can be found at the SPE website. http://www.4spe.org/foundation/scholarships.php

Corporate Educational Sponsors:

A $1000 contribution was received from **Martin Stark**, our 2006 Blow Molding Lifetime Achievement recipient. **Bekum America, Inc.** made a matching $1000 contribution.

A $4000 contribution was received from **Captive Plastics** for continuing support of the **John Raymonds Sr. Memorial Scholarship**.

A $5000 contribution was received from **ExxonMobil Chemical Co**. for continuing support of the **Carrie Fox Solin Memorial Scholarship.**

2007 Student Design Competition:

We received 33 applications from **Penn State Eire** and 5 from **Western Washington University**. A subcommittee led by Bob Fitch reviewed the submissions and chose dual winning entries from Penn State Eire. The recipients of the two $1000 awards will be invited to prepare a poster display on their project for our next ABC in Toledo, Oct 10-11, 2007.

Graham Engineering Corporation Continuing Education Grant Program

(Former Workplace Scholarship Program):

Three grants were made to assist employees of **Flambeau Inc, Don Schrank, Sean Ribbke, and Shannon Foulk,** enrolled in the Madison Area Technical College Plastics Technology program.

The **GEC** 2007 contribution for $2000 was received. This is the 5th contribution toward their pledge of $15,000 consisting of seven annual $2000 contributions with a $1000 contribution in the 8th year.

Blow Molding Division School Grant Fund:

Grants from **The SPE Foundation/Blow Molding Division** are available to educational institutions seeking funding for the purchase of blow molding equipment or educational resources pertaining to blow molding. Eligible items include machinery, tooling, auxiliary equipment, instrumentation, controls, finishing equipment, software, and training or educational modules. This program is being promoted for us by the SPE Foundation.

A grant of $4000 was awarded to **Pittsburg State University** to assist with purchase of a replacement parison programmer for their Kautex blow molding machine.

A grant of $1742 was sent to **Penn State Erie** for preventative maintenance service work on their Bekum blow molding machines after being moved to a new lab building.

Other

A grant of $3450 was made to assist the **SPE Mid Michigan Section** with **PlastiVan** visits to local schools.

Travel funding was provided to assist students attending ANTEC.

Back to the Future?

by Scott Steele, PTI

The latest commercial reheat stretch blowing machines are rated at a high end of 1800 bottles per hour per cavity. Those familiar with RHSB know that the output of equipment has steadily rose over the years from 800 in 1985 to the numbers today. 1800 bottles per hour equates to a cycle time of 2.0 seconds per bottle.

The work horse of the PET industry prior to the introduction of high cavitation Sidel rotary machines in 1984 was the Cincinnati Milacron RHB5. These were 4 cavity machines designed to run about 3600 BPH with four cavities, or about 4 seconds per bottle. Engineers and production technicians being what they are, however, never truly respected the recommended production cycle time. Many improvements were made in the machine design to light weight the pallets, then eliminate the pallets, and with the introduction of the IR heating systems, people were running these machines in the low 2 second range and indeed sub 2 second range in the late 1980's, over 20 years ago. 2 seconds per bottle

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Graham Machinery Group Continuing Education Grant Program

The Blow Molding Division of the Society of Plastics Engineers and Graham Machinery Group co-sponsor a program for continuing education of blow molding industry workers. By making financial resources available to Blow Molding Division member companies, this program will assist more people in obtaining continued education in blow molding and improve their job-related skills.

Up to $500 per person is available to attend an SPE Blow Molding Conference, an SPE Seminar in Blow Molding, or other program applicable to blow molding.

Eligibility Criteria:

1. The employee must be a full-time employee of one of our member companies (having at least one current member of the SPE Blow Molding Division).
2. The employee's job function must be blow molding related.
3. The employee's academic training must not be higher than Associate Degree.
4. The employee must have company recommendation and support.
5. Costs exceeding $500 will be the responsibility of the employee or employer.

How to enroll:

1. Submit a request to the Blow Molding Division at the following address:

   Mark Heitker
   Innovene Tech Center
   1230 Battleground Road
   LaPorte, TX 77571
   Mark.Heitker@innovene.com

2. Include a letter of support from your company.
3. You will be notified of acceptance before the event that you wish to attend.

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corresponds to a rate of 1800 bottles per blow mold per hour which is the state of the art today.

While it is no small engineering task rotating a wheel with 30 cavities on it every 2 seconds – a whopping 30 RPM, we do have to give credit where credit is deserved. The RHB-V demonstrated what could be done with PET cycle times long before the rotaries thought about cranking up the wheel. The RHB-V was limited to 4 cavities and the machine design did not scale to higher cavitation. However, even in 1985, it took the Sidel SBO 10 with 10 molds to out produce the RHB-V which was running in the range of 7,000 bottles per hour. Once the SBO24 came along which produced 18,000 bottles per hour with 24 molds, the fate of the RHB was sealed.

Now that rotary technology has caught up, one might fairly ask, where is the progress? To run in the 2 second range on an RHB-V, huge amounts of air cooling on the base using high pressure air was required. Ear muffs were required to tolerate the explosion of air instead of running through the exhaust manifolds. Today, the air is being recycled and one can hold a conversation about the latest baseball trade standing in front of the newest machines. The RHB also was a simple machine but one full operator was required to keep the process under control, the parts feeding, and the bottle production flowing. Today, this of course is all automated and the same operator is often attending 2 full machines plus other duties. While that one RHB operator scrambled to inspect bottles and do SPC quality checks on a few thousand bottles per hour, today the operator monitors one hundred percent inspection systems measuring bottle quality on machines running in the realm of 50,000 bottles per hour.

No, we haven't kept pace with the electronics industry which is making processors a million times the computational power compared to the processors of 20 years ago. We can argue whether we have made progress at all in basic cycle time. But in the cost of the bottle, we have made huge strides. Lower weights, better resins, and higher output machines all combine to make products like 2L soft drink bottles which sell the same for the same price today as they did when they were introduced in the 1970's.

GE Plastics' Tough, New Xenoy* Resins Offer One-Step Solution for Vapor Permeation Challenges of Small Engine Fuel Tanks

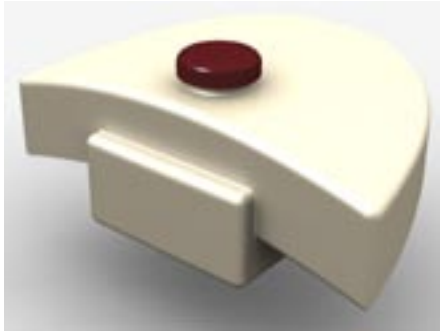
PITTSFIELD, Mass./USA – April 10, 2007

GE Plastics today announced new grades of its tough Xenoy* resins, which are excellent candidates to help meet the regulatory, performance, and cost challenges of molding fuel tanks for lawn mowers, snow blowers, personal recreation vehicles, generators, and other small engines. Xenoy X6800BM blow-molding and Xenoy 6620-GT Injection-moulding resin grades provide a one-step, monolayer solution to help meet current and upcoming California Air Resources Board (CARB) and U.S. Environmental Protection Agency (EPA) standards governing vapor emissions from small engine off-road fuel tanks.

Xenoy resins avoid the high costs of traditional multilayer extrusion blow-molding processes, as well as the cost and time required for secondary fluorination of conventional monolayer molded tanks. The new materials also provide an outstanding balance of mechanical performance and weatherability, and are available in both natural and pre-colored black.

"The increasingly strict requirements of CARB and EPA Regarding fuel permeation in small engine tanks are driving the need for new material solutions," said Craig Williams, industry manger, Transportation at GE Plastics. "Because existing multilayer and monolayer approaches involve significant complexity, GE Plastics developed the new Xenoy resins that offer molding simplicity, speed, high performance, and compliance with regulations – not just today, but into the future. Xenoy resins for small engine off-road fuel tanks provide a one-step molding solution to help consumers meet new regulations while remaining competitive."

Key applications for the new Xenoy resins include walk-behind consumer mowers, six million of which were shipped in the United States in 2006, and hand-held gasoline blowers and trimmers, with more than 8.6 million units shipped last year, according to the Outdoor Power Equipment Institute. Snowmobile fuel tanks are another large application, with about 90,000 smowmobiles shipped in the United States in 2006, according to the International Snowmobile Manufacturers Association.



Xenoy X6800BM and Xenoy 6620-GT resins not only comply with the current 2007/08 CARB standard, which limits fuel vapor emissions to 2.5g/m2/day for small off-road engines, but also comply with the tighter 2011/12 limits of 1.5g/m2/day. CARB requirements are becoming the de facto industry standard.

Compared to multilayer extrusion blow molding, a complex barrier solution that can require a capitol outlay of $2 to $5 million for the equipment, blow- or injection-molding Xenoy resins is simple and may potentially utilize existing tooling. In contrast to post-molding fluorination of monolayer parts, which requires a secondary operation and may perform unevenly, the new Xenoy resins incorporate an inherent barrier material that delivers consistent permeation resisitance throughout the part.

Other benefits of the new materials include:

- Excellent high- and low-temperature ductility
- Excellent UV stability
- Efficient processing with robust regrind capability
- Ability to do hot-plate or vibration welding
- Available in black and natural color

Other applications include fuel tanks for jet skis, generators,chainsaws, rototillers, ice augers, go carts, power washers, golf carts, and other devices requiring small off-road engines.

For more information on GE's Xenoy resin, please visit the GE Plastics' website at www.geplastics.com.

*Xenoy, LNP, and Lexan are trademarks of General Electric Company.

Consistent Factors Affect Rising North American Resin Costs

By Jeffrey Light, A-ToP Polymers, Inc.

As of the date of this article, May 12th prices for all major blow-molding materials HDPE, PP and PET have risen in calendar '07. Each of the three pellet markets have been affected by a number of factors which can be summarized into two basic categories; the matrix of supply/demand economics or the desire to maintain/enhance profit margin levels. One thing for sure, the resin industry has consistently demonstrated that the global marketplace for blow molding grade resin is here to stay. Specifics regarding each of the three major material categories are detailed below.

High-Density Polyethylene

After a volatile 2006 in which the cost for HDPE resin rose for the most of the first part of the year and fell throughout the second half, 2007 has started the same as 2006. Virtually anyone in the PE market will tell you that the market price for blow molding HDPE has risen 6 cents since the first of the year and that producers have valid reasons for seeking the increases also in play at this time. North American PE manufacturers are in the process of implementing further increases in the amounts of 4-cents (HD & LD) and 7-cents (LL-hex and octene) effective May 1. Producers have also released announcements in the amount of additional 5-cents for all grades of PE, effective June 1.

The primary reasons for the desired PE increases, both achieved and nominated, include a very strong export market which is helping to keep North American production high while inventories are unusually low in the midst of rate-able domestic demand. This demand segment is fueled, in part, by the manufacturing cost advantage presently enjoyed by North American producers vs. producers abroad given comparable feedstock fundamentals.

Polypropylene

Similar to the PE market, pricing for PP resin in 2006 was generally upward in the first half of the year and downward in the second half. Also true for the PP market price is the fact that 2007 has seen PP rise 8 to 9-cents per pound as of this point in May. However, contrary to the PE market, the primary reason for the upward movement seen in PP has been rising feedstock costs as opposed to extraordinary domestic demand or highly profitable export opportunities. Domestic demand has been relatively steady and producers have successfully managed production keeping inventories in check, albeit below average. However, the rise in PP resin costs is more directly tied to the desire to maintain margin.

To date, PP resin prices have moved upward in sync with propylene monomer throughout 2007. This reality has not enabled PP producers to increase margins. This ongoing market condition, which started with the January monomer settlement, again has PP producers trying to maintain margin levels which have been elusive in this month after month battle to offset rising production costs. That stated, it is no surprise that PP producers seek to solidify most, if not all of their May nominations ranging from 5 to 9-cents per pound. Many market observers expect additional monomer increases in the near-term due to the seasonal increase in the alkylation value of propylene monomer, thus producers are expected to again invest in margin maintenance activities in the face of increased feedstock costs.

PET

In terms of economics, it is difficult to quantify if the 2006 and to-date 2007, PET pricing market more closely resembles that of PP or PE, so we'll have to document it's simply another market altogether. A strong case can be made that both categories of factors, supply/demand and margin concerns, played significant and possibly equal roles in the resultant market movements. As a result of the 2005 hurricane caused material shortages, off-shore producers flooded the North American market to compensate for the domestic production outages. As a result of their success in placing pounds during our time of need, producers located overseas have capitalized in gaining further recognition and market share, beyond their exposure prior to the storms.

Given global feedstock economics, in which domestic PET manufacturers are disadvantaged (opposite of domestic PE producers to their global market at this time), overseas PET producers

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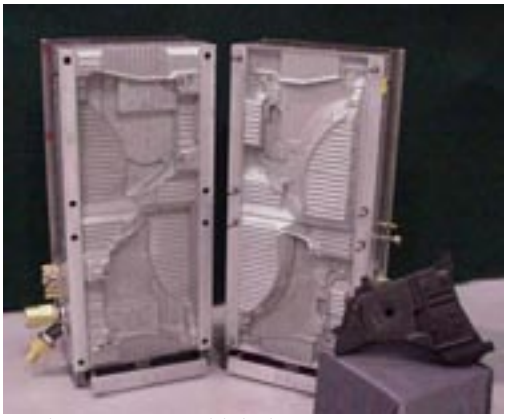

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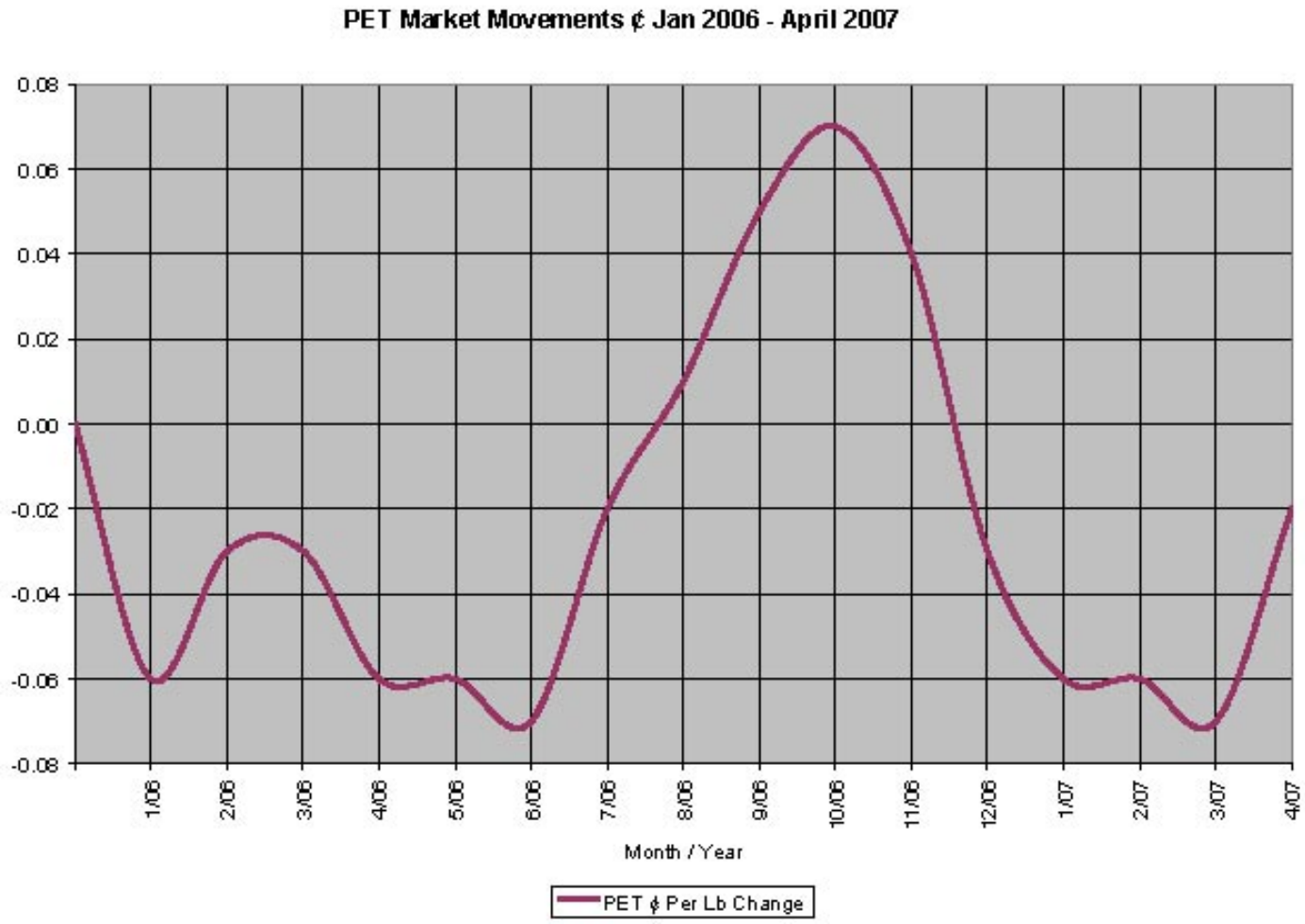
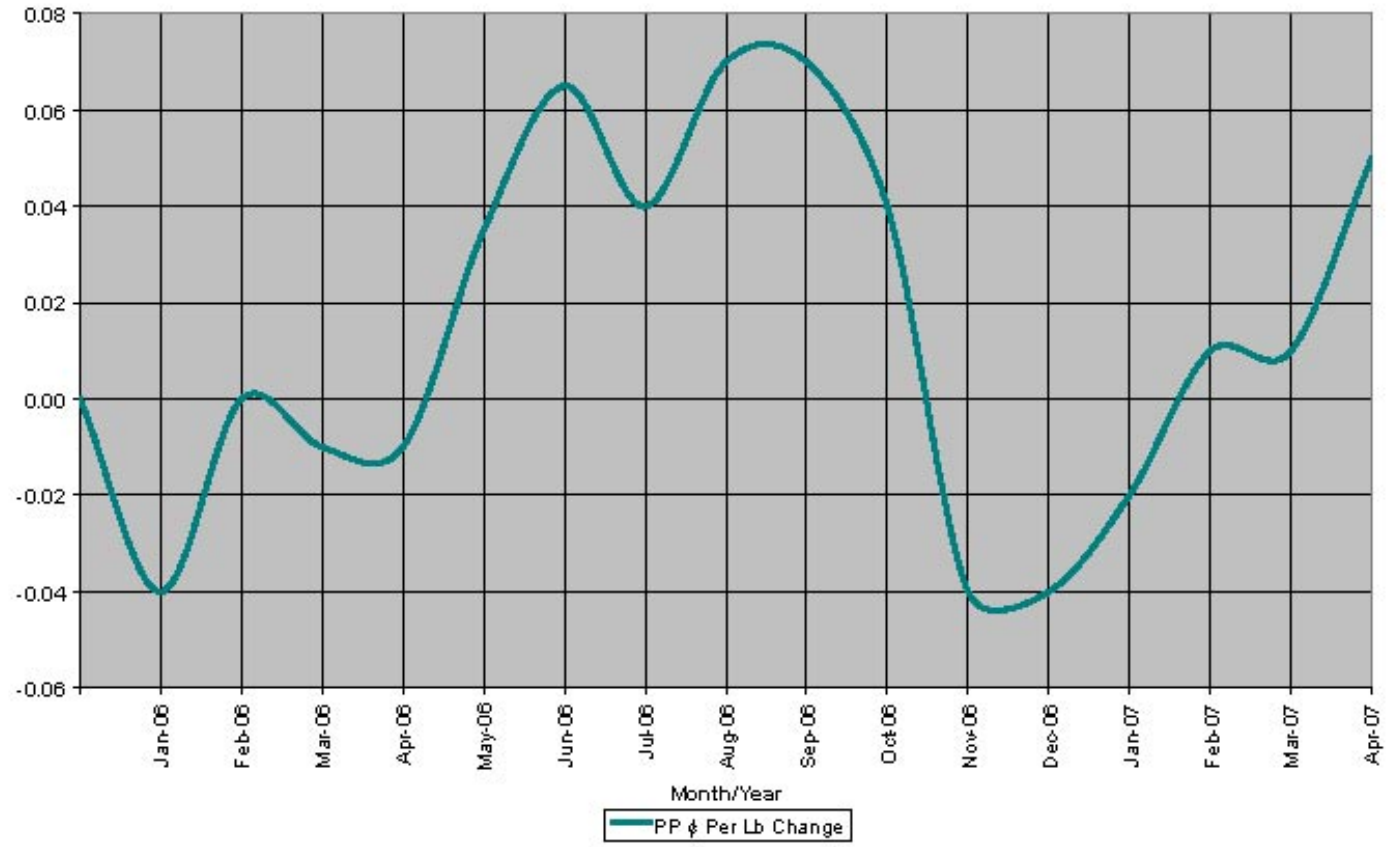
are poised to compete in an on-going fashion in North America for the foreseeable future. Speaking to margin concerns, domestic producers find themselves faced with the same challenge as PP producers in that upward feedstock costs have outpaced acquired resin price increases. Future domestic PET producer margin levels will be determined by their ability to raise prices in the midst of off-shore producer efforts to gain additional market share in North America. PET prices have risen, in most cases 5-cents since February 2007 with negotiations presently in play concerning the 3-cents requested for May. One producer reportedly has nominated an additional 4-cents effective June 1.

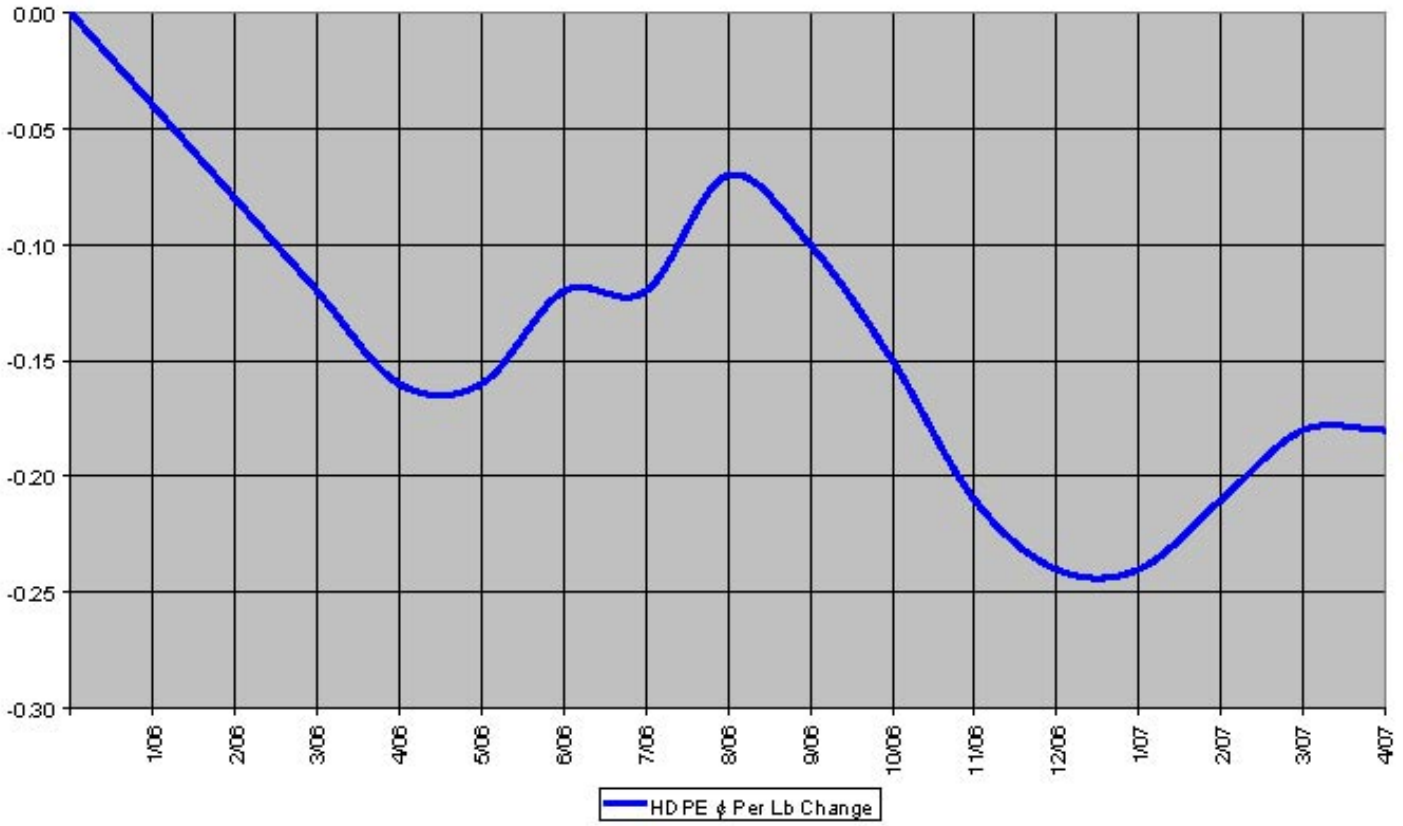
Included with this script are individual graphs which reflect the month over month market price movement for each polymer. Each display commences with the market movement off baseline, which was established using 12/05 so as to document the changes inclusive of the January 2006 development. The data points used to create these charts was based on general market knowledge and should not be viewed or understood to reflect the actions, prices, or efforts of any one company, association or organization.



PP Market Movements ¢ Jan 2006 - April 2007



HDPE Market Movements ¢ Jan 2006 - April 2007

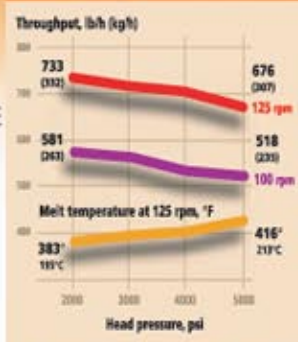


How to Boost Blow Molding Productivity?

The Xaloy® Fusion™ Screw *pumps more melt.*

With today's sky-high resin prices, productivity is more important than than ever. Whether you're running PET, HDPE polypropylene or other polyolefins, the Xaloy® Fusion™ screw can boost your productivity by raising extruder output. And it works in film/sheet extrusion and injection molding, too.

Extruding HDPE



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Can you afford to pay 7% more for your resin?

When you make either a round variation on the whole parison round section, whereas you need a different – and opposite – action on the parting line and at 90° from the parting line.

Shaping die and mandrel is not a solution either, because it would create a permanent effect also where it is not needed – that is on the part body, where the stretching conditions are more favorable – resulting in uneven thickness. When you make either a round container or a jerrycan, some typical thickness defects appear due to the parison trapped by the mould parting surfaces at the top and bottom edges of the cavity: an excessive thickness at the parting line and a thin wall thickness at the corners.

You can not get rid of those defects with a standard “axial” parison thickness controller, because it produces the same thickness variation on the whole parison round section, whereas you need a different – and opposite – action on the parting line and at 90° from the parting line.

Shaping die and mandrel is not a solution either, because it would create a permanent effect also where it is not needed – that is on the part body, where the stretching conditions are more favorable – resulting in uneven thickness.

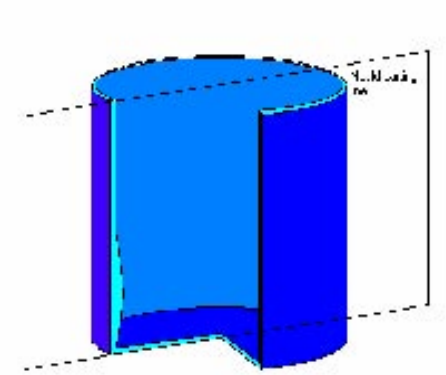
The new TCS (Thickness Compensation System) by Uniloy Milacron provides an effective solution for a large number of cases, allowing a compensation of the parison thickness along the circumference.

Successful cases.

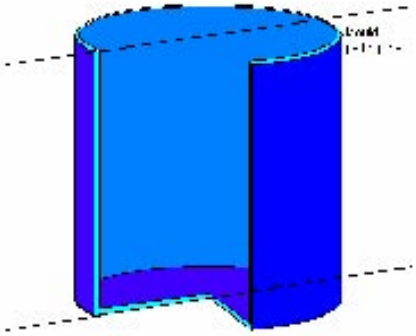
Successful applications have been performed on round disposal bins, rectangular jerrycans, and L-ring drums. Up to 7% net weight reduction has been achieved through a more uniform thickness distribution, keeping unchanged the minimum acceptable wall thickness.

The excess of resin at the parting line has been eliminated, significantly reducing the cycle time (less thickness = faster cooling) and improving the part quality (uniform thickness = no shrinkage deformation).

without TCS



with TCS



How the new TCS works?

The new TCS by Uniloy works on the principle of a dynamic variation of the gap between die and mandrel during the parison push-out.

This variation can be concentrated in some angular position of the parison, not affecting in the same way the whole parison circumference.

"Dynamic" means that this variation is different in different moments of the push-out time, according to a profile that can be set by the operator in the control panel.

The new TCS can be installed on most Uniloy industrial heads, both accumulator type and continuous extrusion type.

The new TCS does not replace the standard "axial" parison thickness control, it works independently for a better wall thickness distribution.

The new TCS can be fitted with different diameters of head tooling, and interchangeability is as easy and quick as for standard head tooling.

The new TCS has no heat-sensitive parts in the high-temperature sections of the head: no hydraulic nor pneumatic nor electric parts.

The new TCS is suitable for retrofitting most Uniloy-Moretti and Uniloy-Milacron machines in the field.

The new TCS is available at a lower price than any other device for the same purpose.

... and how much resin will you save?

In order to guarantee that a new TCS unit will provide the expected performances, every application of a TCS system must be preliminarily approved by Uniloy on the basis of the following information to be provided by the customer:

type and size of the head;

design of the part to be blow-molded;

if the part is already in production, measure of the present die and parison "lay flat".

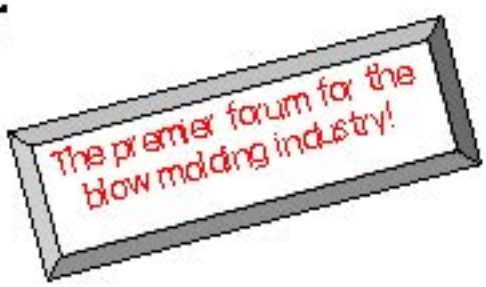
Blow Molding Division
presents the

Annual Blow Molding Conference

October 10-11, 2007

Seagate Center

Toledo, Ohio



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Registration before September 14, 2007
Registration Fee : SPE Member $350.00;
Non-member $475.00 **(This fee includes a 1 year SPE Membership)**
Fee includes all materials, lunch and dinner.

Registration after September 14, 2007and at the door.
Registration Fee : SPE Member $400.00;
Non-member $525.00 **(This fee includes a 1 year SPE Membership)**
Fee includes all materials, lunch and dinner.

Payment Methods:

1) Check – made payable to SPE Blow Molding Division, sent with registration to:
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OR 2) Corporate Credit Card – Call Scott Steele at 419 867-5403, E-mail s.steele@plastictechnolgies.com

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