SPE®

BLOW MOLDING QUARTERLY

A Journal of the Blow Molding Division of the Society of Plastics Engineers

Fourth Quarter 2017
Volume 01 | Number 04

MARCEL DE BOTTON, LIFETIME ACHIEVEMENT AWARD WINNER

STILL SHAPING THE FUTURE

IN THIS ISSUE:

BLOW MOLDING
annual conference

October 8-10

Sheraton Station Square Hotel | 300 West Station Square Drive | Pittsburgh, Pennsylvania 15219

The Sheraton Station Square Hotel in Pittsburgh will be the site for the 34th Annual Blow Molding Conference. ABC 2018 will feature industry speakers offering presentations on packaging, medical and industrial applications, machinery and design innovations, and materials and processing, to name a few. Many plastics related businesses and manufacturing sites within driving distance of Pittsburgh making it another ideal location for the ABC. Make plans now to attend this premier event solely for the blow molding industry!

Speaking Opportunities:

Are you interested in being a guest speaker? We are looking for non-commercial presentations regarding advancements and innovations in processing, materials, mold-making, and hot topics in the industry such as sustainability and use of recyclable materials, to name a few. Click here for a Speaker Abstract Form and presentation guidelines or contact Deirdre Turner, Conference Coordinator at deirdremturner@gmail.com

Hotel Accommodations:

All attendees of ABC 2018 will receive a discounted room rate of $175. A reservation link will be available on the ABC 2018 website in Spring 2018.

Transportation:

The Sheraton Station Square is Pittsburgh's only riverfront hotel and located approximately 20 miles from Pittsburgh International Airport. Transportation from the airport to the hotel includes taxi and Super Shuttle which runs every 15-30 minutes from the airport. Reservations are recommended for the Super Shuttle. Call 800-258-3826 for shuttle reservations.

Visit www.blowmoldingdivision.org for information and updates regarding the ABC 2018 conference program, guest speakers, exhibit opportunities and more.

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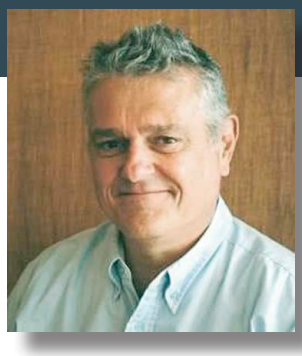
SPE BLOW MOLDING QUARTERLY

Fourth Quarter 2017 | Volume 01 | Number 04

The Blow Molding Division of the Society of Plastics Engineers awarded Logoplaste's founder, Marcel de Botton the prestigious Lifetime Achievement Award at their annual conference in Chicago.



Cal Becker

Fall 2017– "Change" Delivered

We kicked off 2017 with an article entitled "Year of Change". Certainly this has proven true globally with both natural and man-made catastrophes as well as causes wrought through the connection of social networking. For SPE BM we experienced the following changes and achievements:

• After several productive years of SPE Board service, Mr. Ron Puvak stepped down after accepting the Managing Director position at Contract Packaging Association. Ron's tireless efforts and many contributions will be sorely missed and never forgotten. From our full Board team and many SPE members we wish him the very best at his new endeavor!

• With his retirement this spring from Ineos Olefins & Polymers, Mr. Mark Heitker was voted in as an SPE BM Emeritus member. Mark has been a leader for many years in our BM division holding several board positions. He is also a SPE National Honored Service Member. From the full board we wish Mark nothing but the best in his retirement. And as an Emeritus member we look forward to his continued SPE support.

• At this year's 75th ANTEC, we had two members nationally recognized: Mr. John Rathman with Chevron Phillips as SPE Fellow and Mr. Ben Lopez, Kautex Machine Inc., as a SPE National Honored Service Member.

• Our Blow Molding Division was awarded a Gold Pinnacle award and Communication award given by SPE's National at the 75th ANTEC.

• We voted in four new Board members from top notch blow molding conversion and chemical companies: Mr. Lloyd Martin from CKS Packaging Inc., Mr. David Brooks with Graham Packaging Company, and Mr. Todd Hogan and Mr. Sam Crabtree from The Dow Chemical Company.

• We also have three new potential board members that have attended a board meeting and are interested in joining in 2018. Two from converters and one from an Equipment manufacturer.

• The SPE Blow Mold Division delivered YOY improvement through the quality and attendance of our 33rd Annual Blow Molding Conference. The credit for these achievements goes to the division sponsors and our many SPE blow molding volunteers. A special highlight for me from the conference was the conferring of the 2017 Lifetime Achievement Award to recipient Logoplaste founder, Mr. Marcel de Botton.

• And finally, this year we launched our new technical *Journal of Blow Molding*. This effort directly supports our Mission statement:

"Promote, Communicate and Disseminate Knowledge Relating to the Art and Science of Blow Molding Technology."

I exhort our Blow molding volunteers to stay grounded and stay focused on our plans, to adapt to change and aim for our team goals. ■

Cal Becker

New Members

Membership is an important part of the Society of Plastics Engineers. Without members, the Society could not function and simply would not exist.

With that in mind, the Blow Molding Division would like to acknowledge its new and re-joined members for the 2017 calendar year.

Jaco Scheepers
Synlait Milk Ltd.

David Brooks
Graham Packaging

Steven Petinakis
PACT Group - VIP Packaging

Brent Barefoot
Solo Incorporated

Jillian Steffek
Oshkosh Corporation

Insu Seol
Hannam University

Emily Reynolds
Colortech, Inc.

Allison Osmanson
University of North Texas

Bryan Margaria
John Deere

Sarah Schäfer
Institute of Plastics Processing (IKV) in Industry and the Skilled Crafts at RWTH Aachen University

Edwin Tam
Teknor Apex Company

Tom Van Pernis
Pennsylvania College of Technology

Robert Perrier
RTi

Sandra Bell
John Deere

Hanifi Akyurt
Itü

Basher Al Basher
Repall

Oleksandr Tsepelov
AST Private Manufacturing

Damien House
Burt's Bees

YongzhengPpan
3M Singapore

Jennie Howse
Garlock Printing and Converting

Thomas Barrett
Bekum America Corp.

Timothy Vander Kooi
Fordham Plastics

John Doster II
SPI Blow Molding LLC

Judith Watkins
Additive Plastics Group, Inc.

Jens Schlueter
W. Müller USA, Inc.

Martin Johnson
Jabil

Robert Madden
Shawnee State University

Daniel Calby
Plasticade, Inc.

Steven Udwin
Woodland Consultants LLC

Chris Allen
Sun Chemical

Jim Janeczek
Milacron

Volker Plehn
Toray Resin Company

Drew Washburn
Gamma2, Inc.

Fiorenzo Parrinello
SACMI

Larry Glass
Strohwig Industries

Chance Rose
American Tool And Engineering

Gaston Astoul
Plastimec S.A.

Caleb Roof
Shawnee State Univeristy

Evan Syverson
Sodick Inc.

Mark James
Denso

William Asmann
Nolax Inc.

Brian Bartle
Power Container Corporation

Patrick Farrey
Society of Plastics Engineers

Sachin Awatade
John Deere

Jacob Wall
Pittsburg State University

Matt Headrick
COAST Systems

Tim Redler
Ring Container Technologies

Jason Fruit
John Deer

Andrew Ferrier
KL Outdoor

Guillaume Vinette
Weber International Packaging

Zubair Ashraf
Waheed Shahzad Plastic Works Pvt Ltd

Nan Wei
Deere & Company

Craig Watson
TrendPac

Alexandra Warren
Amcor Rigid Plastics

Samuel Dix
Trexel Inc.

Edward Kelly
Consolidated Container Company

Charles Coleman Jr.
Milacron

Robert Quinlan
HC Companies

Jerry Sherman
Coast Systems

Migue Noguez
Zhongding USA Inc.

Geoffrey de Rohan
DenTek Oral Care, Inc.

Alexander Arsic
A. Schulman Inc.

US PET Resin Makers Seek Action Against Imports

By Frank Esposito, *Plastics News*

Four U.S. PET resin makers are asking for anti-dumping duties to be placed on PET imported from five countries.

PET makers DAK Americas LLC, Indorama Ventures USA Inc., M&G Polymers USA LLC and Nan Ya Plastics Corp. America have filed petitions alleging that imports of PET resin from Brazil, Indonesia, South Korea, Pakistan and Taiwan are being sold at less than fair value in the U.S. and are causing material injury to the domestic industry.

Those firms have asked the U.S. government to investigate the dumping and any injury, and to impose anti-dumping duties on imports of PET resin from the named countries, according to a Sept. 26 news release from the New York law firm of Kelley Drye & Warren LLP. The petitions were filed with the U.S. Department of Commerce and the U.S. International Trade Commission.

The filing is in response to surging volumes of "aggressively priced" PET resin imports from Brazil, Indonesia, South Korea, Pakistan and Taiwan, according to the release. Import volume from those countries grew more than four times from 2014 to 2016, climbing from 148 million pounds to almost 600 million pounds.

PET resin from those countries "continued to rapidly enter the U.S. market in the first half of 2017," officials said in the release. Imported material "undersold the domestic industry, taking sales from and exerting considerable downward pricing pressure on U.S. producers."

As a result of increasing volumes of low-priced imports, the condition of the domestic industry has suffered, officials added. U.S. producers "have experienced declining production and shipment volumes and deteriorating financial performance as a result of the lost sales and price depression caused by the subject imports."

Foreign producers of PET resin "also continue to threaten the domestic industry with additional injury due to their massive and growing production capacity and extensive unused capacity that will be used to export large volumes of unfairly low-priced product to the United States," they said in the release, adding that the injury to the domestic PET resin industry "is likely to continue if duties are not imposed to offset these unfair trading practices."

Paul Rosenthal of Kelley Drye & Warren said that "the substantial increase in unfairly-traded PET resin from these five subject countries has hit the domestic industry hard and threatens the livelihoods of American workers."

"U.S. PET resin producers are seeking the trade relief that is badly needed for the recovery and future success of the industry in the United States," he added.

According to the release, the Commerce Department will determine whether to initiate the anti-dumping duty investigations within 20 days of the filing. The USITC will reach a preliminary determination of material injury or threat of material injury within 45 days. The entire investigative process will take approximately a year, with final determinations of dumping and injury likely occurring by fall 2018.

This isn't the first time U.S. PET maker have taken such action. In March 2016, the trade commission voted to place anti-dumping duties on PET resin from Canada, China, India and Oman. That request had been made by DAK, M&G and Nan Ya, again represented by Kelley Dryer & Warren.

Market analyst Phil Karig, managing director of the Mathelin Bay Associates consulting firm in St. Louis, said that it's "not surprising" that PET has flooded into the U.S. from these countries in the last year.

"Once anti-dumping duties were levied on imports from other PET producing countries, especially China, PET buyers here naturally went looking for other suppliers of low cost PET imports," Karig said in an email to Plastics News. "Absent anti-dumping duties being levied on just about every foreign source of PET, the market has evolved into a game of whack-a-mole where making imports from one country more expensive quickly shifts demand to other low-cost countries."

He added that, unfortunately for U.S. PET buyers, this new anti-dumping complaint "has the potential to substantially reduce the remaining options for low cost imports."

"The last complaint was largely successful," Karig said. "And with the new administration in Washington more favorably disposed to aggressively pursue unilateral solutions to perceived unfairness in relations with our trading partners...the chances of this latest complaint succeeding are quite high."

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Ring Container Sold to Private Equity Firm MSD Partners

By Jim Johnson, *Plastics News*

Ring Container Technologies Corp., one of North America's largest blow molded container makers, is selling to an investment firm backed by Michael Dell.

Ring, with annual sales of more than $300 million, makes high density polyethylene and PET bottles for food service, retail food and other markets.

The seller is Carl Ring, who received the lifetime achievement award from the Blow Molding division of Society of Plastics Engineers in 2013. The buyer is MSD Partners LP, an investment adviser created by the principals of MSD Capital to allow investors to take part in strategies developed by MSD Capital, a private investment firm that exclusively manages investments for Dell Inc. founder Michael Dell and his family. Terms were not disclosed.

The deal includes manufacturing sites in 17 cities in the United States, Canada and the United Kingdom. In addition to blow molder Ring Container, the transaction also includes Rapac LP, described as the largest expanded polystyrene recycler in the United States. Rapac also makes engineered resins.

"Throughout the due diligence process, we maintained a commitment to identifying a new, long-term owner who appreciated Ring's culture and other qualities that have been fundamental to our growth into an industry leader," Chairman Carl Ring said in a statement. "MSD Partners not only is an organization that we respect, but also it is a seamless fit with our culture and the best possible owner to move our company forward."

Rick Weil, managing director of investment banking at Mesirow Financial Inc. in Chicago, was not surprised Ring was sold. But, he added, the new owners were unexpected. "It's interesting to see. Ring is one of the leaders in the industry. And I'm not surprised it attracted the attention and investment from somebody like Michael Dell and their entity," Weil said.

"But I think that what's surprising to me is that someone like Michael Dell, who is known as a Renaissance man and is known for groundbreaking technology in its time, has chosen to park money, and not a small amount of money, into the blow molding industry," he said.

"I'm sure they see a quality company, one that can be built upon with further acquisitions," he continued.
Weil said it is striking to see someone outside the industry so associated with high-tech set sights on a middle-market company like Ring.

"He is not looking to keep it the way it is. I'm sure he has plans to grow it," Weil said, adding he would not be surprised to see Ring serve as a growth platform to expand packaging holdings to create "a global powerhouse. I think that's probably in his DNA to do so. There's ample opportunity."

Plastics packaging provides investment opportunity because of its stability and fragmentation. Even when the economy weakens, people still need to use products packaged in plastic containers, he said.

Ring, based in Oakland, Tenn., fit MSD Partners' criteria for several reasons, the investment firm said in a news release.

"Ring fits seamlessly with MSD Partners' strategy to invest for the long term in companies that are stable, in industries that are thriving, and in management teams that are able to generate growth," said Kevin Brown, a managing director in the private capital group at MSD Partners.

Ring ranked 13th in the most recent Plastics News ranking of blow molders in North America with estimated annual North American blow molding sales of $300 million and estimated overall sales of $370 million.

Carl Ring joined Ring Can Corp. in 1980 and helped diversify the firm from metal can manufacturing to blow

molded containers. The company grew organically, primarily, but also made an acquisition in 2012, when it bought Bway Corp.'s plastic bottle business.

Ring has about 700 employees, and the deal is expected to close during the fourth quarter.

Ring CEO Ben Livingston will continue to in that role, with existing members of management, who retain their ownership stake in the firm.

PET Resin Maker M&G Group Files For Bankruptcy Protection in Italy

By Frank Esposito, *Plastics News*

Mossi Ghisolfi Group, a global supplier of polyester resins, feedstocks, fibers and biofuels, has filed for bankruptcy protection in its home nation of Italy.

M&G on Oct. 17 officially filed for the arrangement with creditors procedure — known in Italy as "concordato preventivo" — to ensure equal treatment of creditors, according to a posting on the firm's website.

The companies "are studying a proposal" for an arrangement that will allow their overall activities to continue as a going concern, officials said in the posting, although they cannot exclude "alternative solutions."

Tortona-based M&G's struggles include an inability to finance a massive PET resin project — known as Project Jumbo — in Corpus Christi, Texas. Numerous contractors working at the site have said that they have not been paid. Construction contractor Fluor Enterprises laid off almost 300 workers at the site in September.

M&G also owes $49 million to Mexican conglomerate Alpek SAB de CV for supplies of PET feedstock purified terephthalic acid (PTA). In September, Alpek announced that it was stopping shipments of a PET feedstock to two plants operated by M&G in Mexico and Brazil as a result of the debt.

According to published reports, M&G has stopped PET production at its 1.2 billion-pound capacity plant in Altamira, Mexico. The firm also had filed notice with local officials that it would stop production at its PET plant in Apple Grove, W.Va., which has annual production capacity of almost 800 million pounds.

Alpek made the unusual move of announcing the stopped shipments and the unpaid debt in a news release. In the same release, Alpek officials added that the firm "anticipates difficulties" for M&G to complete the massive PET project in Corpus Christi.

Alpek, which also owns North American PET maker DAK Americas, had agreed to distribute more than 1 billion pounds of PET made at the new M&G unit. In its third quarter financial filing, Alpek said it had $643 million of asset impairment exposure from M&G, as well as a $223 million tax credit.

"Volume, revenues and EBITDA were negatively impacted in [the third quarter of 2017] by the current M&G shutdown," Alpek officials wrote in the report. "Alpek has limited visibility at this time to provide a reliable 4Q17 outlook."

In mid-September, a spokesman for M&G said in an email to Plastics News that the firm "is in active dialogue with its key stakeholders regarding its near-term needs." Earlier this year, M&G officials said that problems with a former construction contractor at the Corpus Christi plant would not stop the facility from opening on time, later this year.

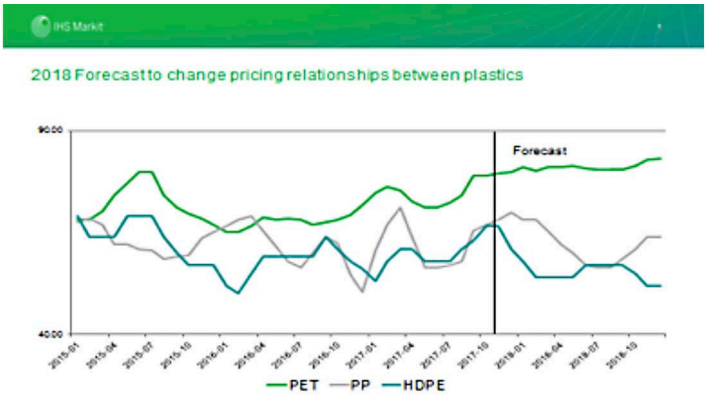
Alpek has annual sales of almost $5 billion, employing more than 5,000 at 23 plants making resins, chemicals, feedstocks and fibers throughout North and South America. Its DAK business unit is based in Charlotte, N.C.

M&G ranks as one of North America's largest PET makers, with a North American headquarters in Houston.

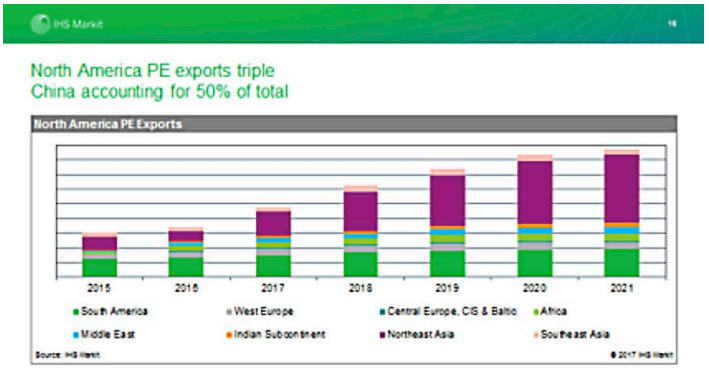
North American Resin Trends Heading into 2018 — PET vs. Polyolefins

By Joel Morales, Executive Director, Polyolefins Americas
IHS Markit

New polyethylene (PE) capacity in North America will have a significant impact on regional and global markets and is expected to impact North American dynamics for PET and polypropylene (PP) as well. These three major resins are entering new territory in 2018 versus recent behavior over the last few years. In the case of PE, with nearly 3.5 million metric tons being added in the fourth quarter of 2017, we are expecting a transition from a market that is very balanced with limited domestic competition to one in which global prices will play a large factor on domestic markets as new production will be focused on exports to Asian markets, which brings with it lower netbacks relative to exports to South America. For PP, the coming year is quite different as lack of new capacity and expected growth in demand are likely to lead to a balanced market with higher margins for producers, but pricing power is likely to be limited because of the threat of importing resin pounds or the imports of both finished and semi-finished goods. For finished goods, think rolled stock of film or staple fiber to weave geotextiles and for semi-finished goods, think of washing machines and refrigerators. As we saw in 2016 for the PP market, when domestic prices become disconnected from global prices, buyers will look to alternative solutions (increased resin imports) to keep themselves competitive globally. In PET for 2018, the market is expected to rebalance from the surprise impact of major North American PET producer M&G's bankruptcy that occurred in the fourth quarter of 2017. With the PET global market as well as the local North American market well oversupplied prior to the bankruptcy, PET buyers have been used to North American prices being set by the equivalent cost of delivered imports into the region. Despite countervailing and antidumping duties applied in recent years on specific countries, oversupply in the globe has just led to other countries taking the place of those who had duties leveled on them. As a result of selling barely above raw material cost, PET has seen some preference over PP in applications such as thermoforming and versus high-density polyethylene (HDPE) in blow molding in recent years. Since the surprise bankruptcy of M&G, prices for PET in the spot market have escalated and price expectations for 2018 have increased, putting less pressure on HDPE and PP in competing applications. In fact, for HDPE, we would expect to see some of the best competitive pricing versus PET in quite some time as can be seen in the 2018 forecast chart for plastics pricing.



Elaborating more on the many expansions coming online in PE (see 2017 expansion chart), these projects are coming online to monetize competitively priced and ample supplies of ethane that have come online owing to shale investments over the last decade. As can be seen in the chart on North American PE exports, a large percentage of new production will be focused on the Asian markets, particularly China, which is responsible for more growth over the next five years than any other country in the world.



Digging more into the PP market, anyone who buys PP knows how closely related PP prices are to its primary feedstock, propylene monomer. The shale revolution has been beneficial to PE producers because the production of surplus ethane in the market has resulted in PE producers switching their feedstocks from "heavy" (crude oil-based) feeds to "light" feed (typically natural gas-based ethane) in ethylene crackers, making them more competitive globally. However, the share revolution so far has been a disaster for propylene derivatives, as switching from the "heavy" feeds to "light" feed reduced the amount of propylene owing to yield differences between fields. This has led to very volatile prices in the market place for propylene since 2009 because of tight supply and demand dynamics.

So prior to 2018, buyers have been used to relatively high prices with little buying leverage in PE, volatile pricing in PP, and PET priced at slightly above raw material costs. Going into 2018, IHS Markit believes buyers are in for some different dynamics in the price forecast. Leverage will return for the PE buyer, but the PET buyer likely cedes some leverage to PET producers, and the PP market stays balanced with a collar put on regional prices by Asian PP imports. Regardless of which of the three resins a blow molder may be buying, 2018 looks to be quite different than the recent past.

For more information on IHS Markit and its services on resin coverage, please contact Joel Morales at joel.moralesjr@ihsmarkit.com or 832 683 2828.

Educational Grants

The SPE Blow Molding Division continues to support all educational institutions seeking funding for the purchase of blow molding machinery, equipment, tooling, controls or educational training resources to benefit students.

For further details, visit:
www.blowmoldingdivision.org

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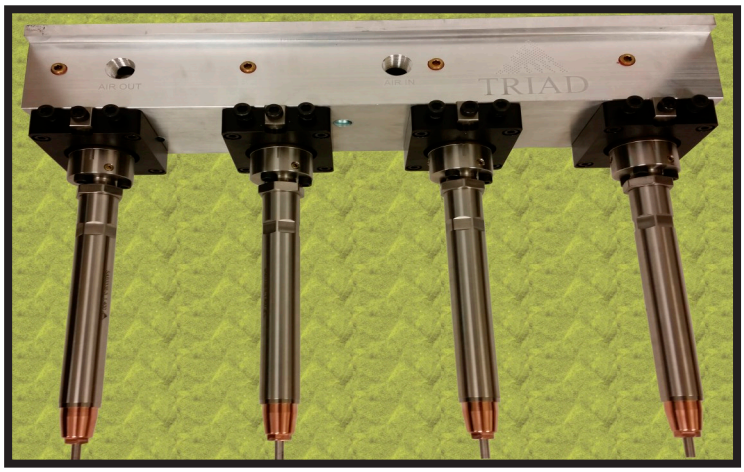
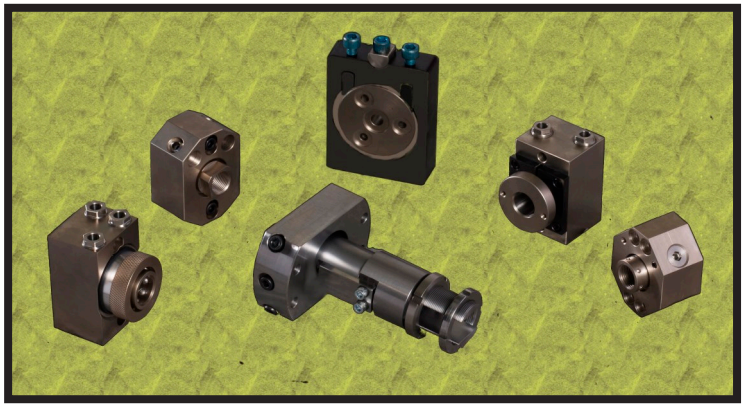


In house design team	Blowpin assemblies	Head Tooling
Machine retro-fits	Blowpin holders	Extrusion head rebuilds
Custom designs	Calibration stations	Parison knife assemblies



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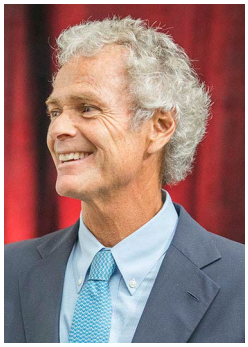
Logoplaste's Founder Receives Lifetime Achievement Award

By Filipe de Botton, Owner, Logoplaste, Lisbon, Portugal

The Blow Molding Division's Lifetime Achievement Award, the Division's highest award, is bestowed upon an individual who has demonstrated outstanding achievements and contributions to the business, science and technical engineering aspects in the field of blow molding.



Filipe de Botton

"First of all, allow me to thank you for the award you are giving not only to my father but also to Logoplaste."

It's not the first time in my life I'm asked to make an introduction at a conference but it's certainly the very first time I am asked to introduce a man who is not only a great man, but also my father.

It's not an easy task when I am talking about a man to whom I owe everything when it comes to my professional life, and my birth! I would also like to thank my Mom, who very kindly decided to join us here in Chicago and who has been supporting the two of us since I can remember.

My father, Marcel de Botton, is a man who has been a friend, a teacher – sometimes a very tough teacher and a confidante. He has always been there when I needed him and has been a person I can always count on when I want advice or to validate a certain situation. My father is a great professional. A man who irrespective of his age has long had vision and concerns about sustainability and environment. He has worked nearly sixty years to promote plastics!

Board member David Hayward (right) of Silgan Plastics presents the Lifetime Achievement Award to Marcel de Botton and his wife Hugette, with board member Gary Carr of Bekum America Corporation (far left).

It's a privilege to work with someone 92 years old and with such experience, who is still thinking of the future with a very clear vision.

Apart from being my father and an amazing businessman, Marcel de Botton is also Logoplaste's "father."

Logoplaste started in 1976 as a reaction to a revolution we had in Portugal back in 1974. In those pre-revolution years, my father owned the largest Portuguese plastic factory in the greater Lisbon area. When the Revolution came, he was obliged to sell, for one dollar, the entire company. Portugal was very close to a Communist system where one could not own private assets.

My father had an idea, one I would characterize more as a reaction, when he decided to set-up small factories within the companies of our customers which would minimize the possibility of losing them all again if another revolution should occur.

This was how he invented the concept of in-house operations, also known as through-the-wall, and the just-in-time production.

It's quite surprising to see how this concept, invented in 1976, is still so current these days, as companies become ever more concerned with environmental and sustainability issues and very impressive for us to see how you can be so right without knowing it.

In 1991, I had the opportunity to buy Logoplaste from my father and my sisters, developing and internationalizing the concept and the company.

Today, Logoplaste manages more than 59 factories, with locations in 16 countries: Brazil, Belgium, Canada, Czech Republic, France, Italy, Poland, Mexico, Netherlands, Portugal, Russia, Spain, Ukraine, United Kingdom, USA and Vietnam. The most up-to-date technologies in injection molding, stretch-blow molding and extrusion molding are used to produce packages across the wide range of market segments.

Facts:
- Logoplaste is in the top 5 largest European rigid plastic converters.
- 39 Partners.
- The Company has 59 plants spread by 4 continents, present in 18 countries.
- A head count of 2,050 employees, with 32 nationalities and 12 Official languages.
- Logoplaste produces 391 packages per second.

Aligning its industrial activity to the development in packaging design, and packaging engineering, under the umbrella of Logoplaste Innovation Lab, the company's mission is: to be the natural choice in the supply of rigid plastic packaging solutions.

Shaping Our Future Together

Our main partners are companies like P&G, Nestlé, L'Oreal, Danone, Diageo, Fairlife, Henkel, SC Johnson, and Johnson & Johnson, with whom we have factories and have been growing at a very strong pace.

Logoplaste's main competitive advantage is its focus on innovation. When we talk about innovation we mean it as a whole, not only design or material, but to look at all the supply chain and challenge it. We need to constantly question again and again the way we do things and constantly ask "why not?" and endeavor to create the "wow factor" every time we talk with our customers.

It would not be fair to talk about Logoplaste and to receive such an award from the SPE without mentioning over 2,000 people that work at Logoplaste and specifically, our friend Rui Abelho, the managing director of our company.

Rui Abelho has honored us by working for Logoplaste for almost 20 years. He is the man who made Logoplaste North America. Over the last nine years and starting from scratch, he has created more than 10 sites with a turnover this year of more than 200 Million USD. Thank you Rui for your dedication, work, friendship and our joint success. ■

REDUCE! REUSE! RECYCLE!

Distinguishing Two Board Members for Their Valued Service

By Brian Spence; Co-Chair, Blow Molding Div. CNG & Product Development Engineer, Silgan Plastics

Every organization has key people critical to the success of its collaborative efforts. These are the team members who set the course and navigate the journey; but most importantly, fuel the group with their energy and effort as volunteers.

With those sentiments in mind, the Division would like to extend a special "Thank You" to two of our esteemed colleagues who have consistently gone above and beyond what was expected of their efforts.

Mr. Ron Puvak has served the Division in many capacities. Some of them were formally elected positions and some were less formal, though equally notable. Mr. Puvak served the Division as its Chair for three years. He served in a Division Officers role for a total of thirteen years and in various other board and committee positions for twenty years. For these years of service, he was bestowed with the title of Honored Service Member.

In addition to the formal roles, Mr. Puvak also served as a general Division coordinator where he channeled such activities as a total restructuring of the board. His energy and drive to better the Division has been impressive to say the least. As a volunteer, he took on far more than anyone could have expected and truly served the Division with honor and passion.

His contributions to our Annual Blow Molding Conference have helped it grow from a small intimate venue into one of the top annual industry events. His attention to detail with the location, program and logistics helped shape the ABC into what it is today.

Unfortunately, Mr. Puvak's career path is leading him in a different direction and he will no longer be serving on the Board of Directors for the Blow Molding Division. He will be missed not simply for his contributions, but for the friendships built over many years distinguished service.

On behalf of the Division, we thank you and wish you well Ron. You will always have a seat at our table and the friendship of your grateful colleagues within the Division.

Mr. Scott Steele is another Board Member who has contributed years of distinguished service. He can also boast many achievements within the Division and Society such as Division Chair and Section President. Both of which were two year terms.

In addition, he served as a Section Officer for fourteen years and a Division Officer for five. He has served in further roles yet, such as various Board and Committee positions with as many as fifteen years of service each. These years of service were recognized when Scott received the title of Honored Service Member.

Most recently, Mr. Steele served as the Division Councilor for six years. In this role Scott coupled his business acumen and rational to offer guidance to the Division. He also performed the duties of liaison between the Blow Molding Division and the Society, where he exchanged feedback between the two groups and represented the Divisions interests.

However, as with all things, there is a start and an end. The term of Councilor is not indefinite and Mr. Steele's second three-year term is coming to a close. This signals the changing of the guard for the Councilor role and the Division will be electing its next Councilor in the near future.

Scott, the Blow Molding Division relies on distinguished individuals who actively contribute to its success. We count you among that number and look forward to seeing what the future holds as we continue to work together. ■

MISSION STATEMENT

Promote, communicate and disseminate knowledge relating to the art and science of blow molding technology.

2017 Student Design Competition

The Society of Plastics Engineers Blow Molding Division conducts an Annual Student Design Contest to promote interest in blow molding applications. This year 18 designs were submitted to the competition.

The Blow Molding Division offers $1,000 for 1st prize, $750 for 2nd prize, and $500 for 3rd prize to a student or group of students who submit the winning entries.

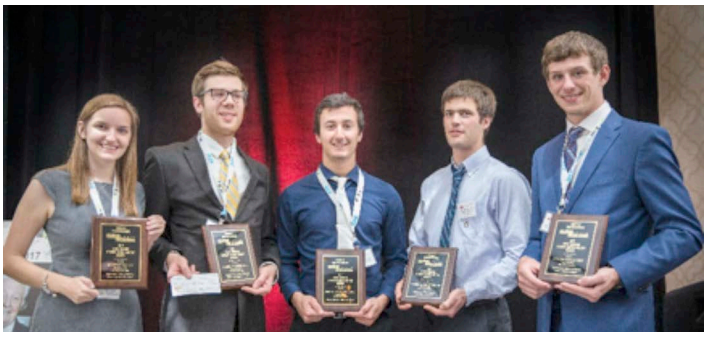
A travel allowance is also offered so the winner(s) can present their proposal in a poster at either an upcoming SPE Annual Blow Molding Conference or ANTEC.

Kevin Orndorf and **Nigel Robertshaw** from Penn State submitted the winning design, Extrusion Blow Molded 4ft Step Ladder. In addition to developing a promising design, the students' assessment of competitive product performance and the comprehensive design specification made their paper stand out. The material and process scope demonstrated their knowledge of blow molding technology. Both students are seniors majoring in plastics engineering technology.

The second place design, Blow Molded Guitar Case, was submitted by **Brendan MacFarlane** and Jeremy Slagle of Penn State. The design protects the instrument while reducing the cost of the case. Jeremy and Brendan are both seniors majoring in plastics engineering technology.

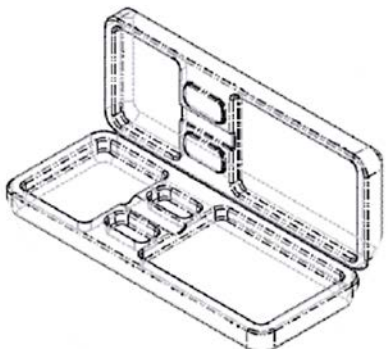
The third place design, Extrusion Blow Molded Pool Carrier, was submitted by **Kate Pellett**, **Chris Weikert**, and **Glenn Spiering** of Penn State. The floating pool caddy's design and material made it an optimal application for blow molding. All three are seniors majoring in plastics engineering technology.

The SPE Blow Molding Division has held its Student Design Competition annually since 2001 and the winners are announced at the ABC conference each year. Entries are judged on novelty, feasibility, and documentation quality. This year 18 designs were submitted to the competition. The winning designs from this year and previous years are available to review on the blow molding division website: www.blowmoldingdivision.org/student-design-contest/

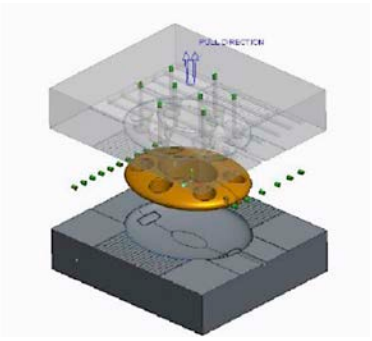


Seven students were recognized at the SPE Annual Blow Molding Conference (ABC) for winning entries in the 2017 student design competition.

Kevin Orndorf and Nigel Robertshaw



Brendan McFarlane



Glenn Spiering and Kate Pellett

Highlights From The Annual Blow Molding Conference

By Dan Weissmann, editor for *The Journal of Blow Molding*, SPE Blow Molding Division

If you were not one of the 300 plus who attended last months' ABC, the division yearly conference, you have missed a very vibrant and informative gathering of blow molding professionals, materials suppliers, equipment vendors as well as meeting some young students who are making their first steps into the plastics and blow molding universe.

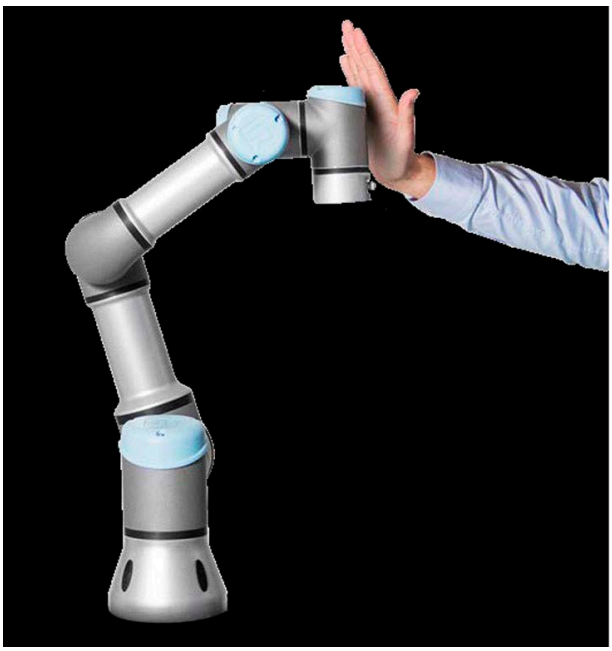
As usual, the conference started with Blow Molding 101. In 17 sessions, the basics of most aspects of blow molding have been presented by experts. Attending the sessions was a mixture of new and experienced people who not only listened but also contributed through comments and questions following the presentations. The audience participation made the sessions even more informative and interesting.

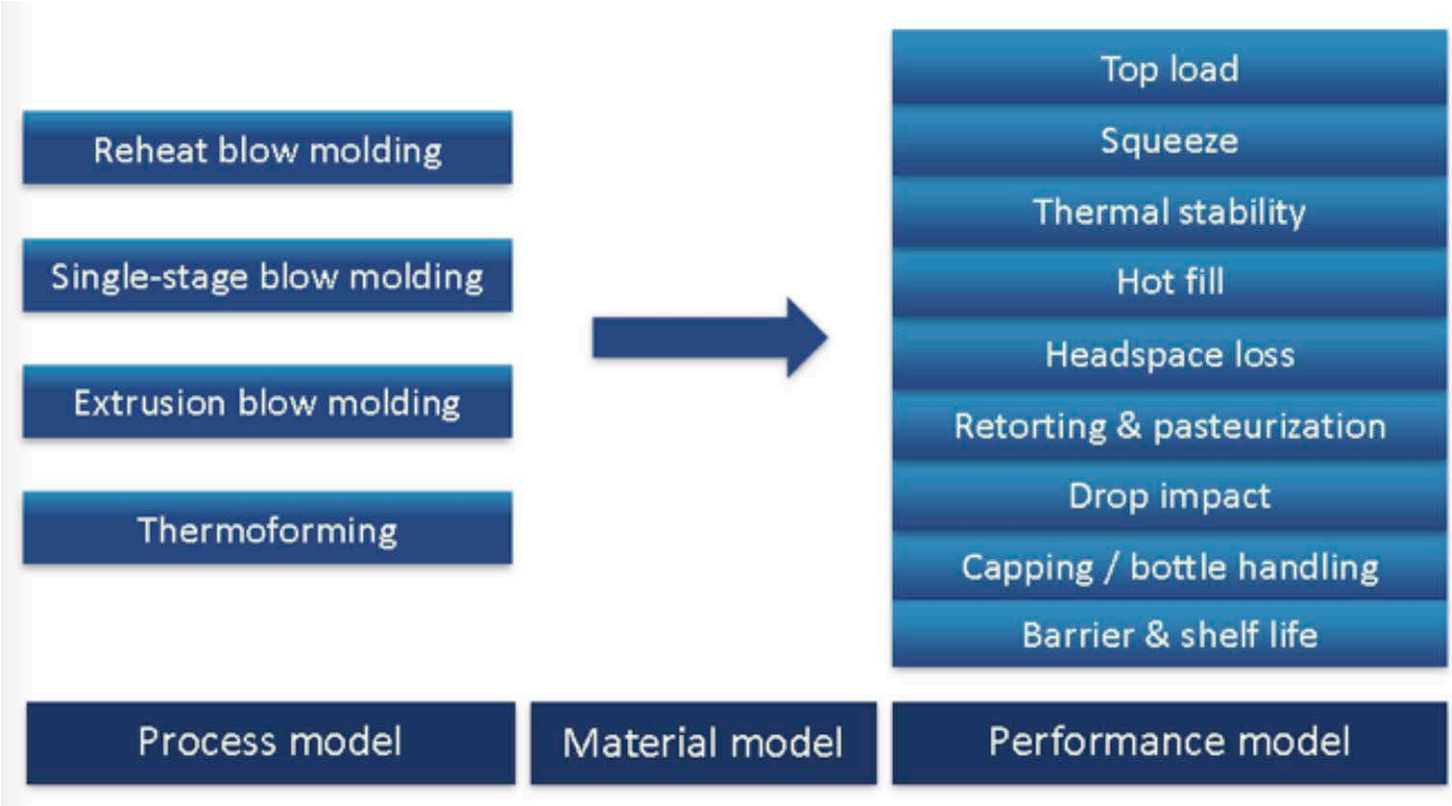
The general session opened with a presentation on innovation, both in products and in packaging, by David Smith of Johnson & Johnson. He summarized the innovation mantra at the company by quoting Dr. Paul Stoffels, the company's Chief Scientific Officer: "Innovation at Johnson & Johnson is about creating strong networks of people who can combine resources, ideas and technologies in a new way." In practice, it translates into a whole gamut of activities of perusing innovations from anywhere within the company as well as on the outside. This includes providing space for outside vendors to do development work, in specifically set JLABs, to supporting suppliers' own development activities, to the use of venture capital. The partnership between the company and the outside resources is intended to leverage and accelerate technology development, synchronizes activities and eliminates duplication while increasing internal mobility for acceptance and adaptation of new ideas.

Another new area presented was Collaborative Robots or Corobots. This new generation of robots, which are typically smaller than their older counterparts, can operate alongside humans. Designed with less mass and slower speeds and programmed to immediately stop on contact with any object, they do not require safety enclosures. Programming the corobot is simple and can be accomplished in a very short time. These features make them less costly to both buy and get into operation as well as very portable so they can be moved easily between jobs.

On the material end Eastman presented Tritan SC (for semi crystalline). Crystallinity content contributes to higher Tg (glass transition temperature) as well as higher HDT (Heat Deflection Temperature). Maximum rate of crystallization occurs around 165°C, similar to heat set PET resins. High level of crystallization is achieved through strain induced crystallization in one or a two steps blow molding process. The material will retain high clarity with little to no haze even in thick walls.

Sumit Mukherjee of Plastics Technologies provided an excellent review of the ever evolving capability of CAE (Computer Aided Engineering) not only in the design but





also in process simulation and virtual testing, as outlined in the figure above.

Process, material and performance models are needed to cover the spectrum from material selection through the manufacturing process and virtual performance simulation. While performing such simulations, optimization of preform design or parison profile can be evaluated along with process conditions and finally being able to identify design deficiencies before ever committing to prototype tool fabrication.

With the ever expanding IoT (Internet of Things), can plastics processing be far behind? The answer was provided by Kautex presentation of IIoT (Industrial Iot) or as it referred to in Europe Industry 4.0. Industry 4.0 is an evolving standard to provide connectivity to processing machinery and testing equipment along with plant management functions so continuous data stream is created tying all aspects of production together through robust and real time analysis. Interaction between process and quality can be derived which in turn will drive on-going optimization. Machine monitoring will detect problems before they impact quality and interrupt production and even initiate corrective actions. Sidel added to Industry 4.0, the possibility of automatic tooling changes driven by plant scheduling and production monitoring. The system will verify that the proper preforms are being fed, to match the intended production. Once on the machine, preform "state" will be determines so that the process can be adjusted accordingly.

Eastman, which for a long while has been leading the Full-Wrap Label Consortium efforts of removing labels during recycling, presented "deseaming" of full body shrink labels. The use of full body label increase the label content in collected PCR to about 6%. The use of an adhesive in the SunLam family of products by Sun Chemicals provides for the label seam to open when exposed to the caustic hot wash of the whole bottle in the beginning of the wet recycling process. Whole labels are then removed from the process leaving behind neat bottles to proceed into the recycling process. Removing labels in the first process step minimizes the chance of contamination of the recycled resin by label inks.

It is not too early to start making plans to join the conference next year in Pittsburgh. Only by keeping abreast with new developments can one assure they are maintaining relevance and competitiveness both on personal and company levels, in the fast changing global industrial environment encountered daily. ■

Selecting the Optimum Extruder and Screw Design for Your Blow Molding Process

By John P. Christiano, Vice President, Technology
Davis Standard, LLC

Selecting the ideal single screw extruder and screw design for your blow molding process can have a significant impact on the profitability and productivity of your operation. This article examines the importance of choosing the best design by comparing the benefits of a groove feed extruder to a smooth bore extruder for processing a HDPE 6 to 8 HLMI (High Load Melt Index) resin.

Extruder Selection Criteria

Criteria for selecting an extruder for a blow molding application relies on input from important stakeholders in your organization. The selection criteria are derived from the categories of process, economic and environmental requirements, as well as supplier reputation. The team making the decision is typically comprised of representatives from process engineering, maintenance and upper management. The priorities of the team members will vary. Upper management will focus on economic drivers; process engineering on process and environmental concerns; and maintenance on equipment reliability and supplier services for the lifetime of the equipment. Considering the perspective of all stakeholders will ensure selection of the most beneficial extruder platform.

Process Considerations

- Output
- Melt temperature
- Melt quality
- Special considerations (i.e. regrind, linearity)
- Flexibility – operating range and turn-down
- Flexibility – ability to process a range of materials

Economic Considerations

- Capital Cost of the equipment
- Operating cost of the equipment
- Energy Efficiency
- Operating life

Environmental Considerations

- Physical footprint
- Sound emissions level
- Heat input into the surroundings

Supplier Reputation

- Experience level and application expertise
- Reliability
- Industry track record

Blow Molding Case Study

This case study compares a smooth bore 4.5-inch (114mm) 30:1 L/D and a spiral groove feed 3.5-inch (90mm) 38:1 L/D for processing a 6 to 8 HLMI HDPE blow molding grade resin. The feedscrews in both extruder platforms are optimized barrier mixing screw designs. We will refer to the smooth bore extruder as 450 SB and the spiral groove feed extruder as 350 SGF.

Smooth bore extruders have traditionally been used in this application because of the capability to process high levels of regrind. However, design improvements in groove feed extruders using spiral groove technology have improved proficiencies for higher levels of regrind.

The process requirements or parameters for the case study are as follows:
o Output: 1000 pounds per hour
o Material: 6 to 8 HLMI HDPE
o Melt Temperature: Below 410 degrees Fahrenheit
o Melt Quality: Thermally homogeneous and uniform color mixing

The important process parameters of output, melt temperature, power consumption and energy efficiency are compared in figures one through four.

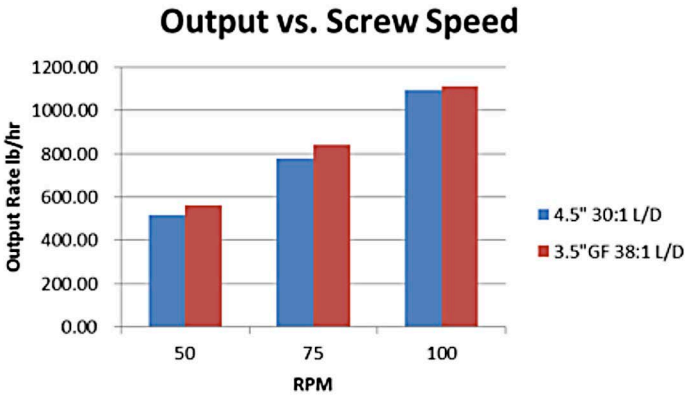


Figure 1. Output rate vs. Screw Speed – 450 SB and 350 SGF

The 350 SGF achieved a higher output at each screw speed when compared to the 450 SB. The smaller diameter 350 SGF achieved a higher throughput at each of the conditions tested because of the efficient solids conveying of the spiral groove solids conveying zone.

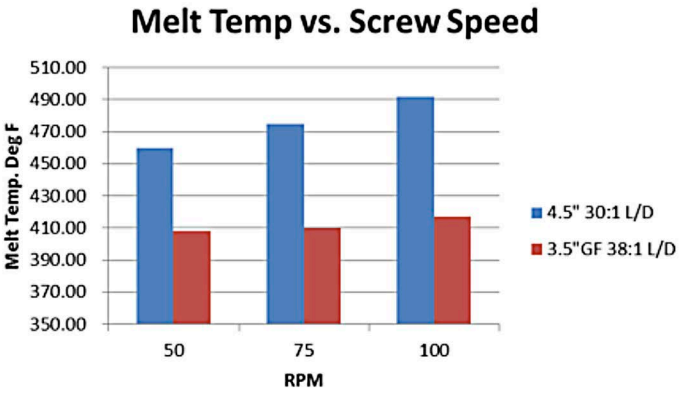


Figure 2. Melt Temperature vs. Screw Speed – 450 SB and 350 SGF

The 350 SGF achieved a substantially lower melt temperatures compared to the 450 SB for all of the screw speeds tested. The melt temperature recorded for the 350 SGF extruder was 80 degrees Fahrenheit lower than the 450 SB at the 100-rpm condition. This figure also shows the larger 450 SB extruder could not meet the process requirement for melt temperature of less than 410 degrees Fahrenheit at any of the conditions tested.

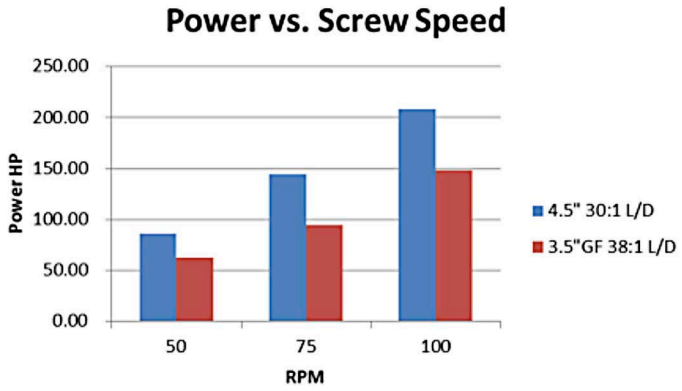


Figure 3. Power Consumption vs. Screw Speed – 450 SB and 350 SGF

This figure shows that the 450 SB consumed more power at each of the conditions tested.

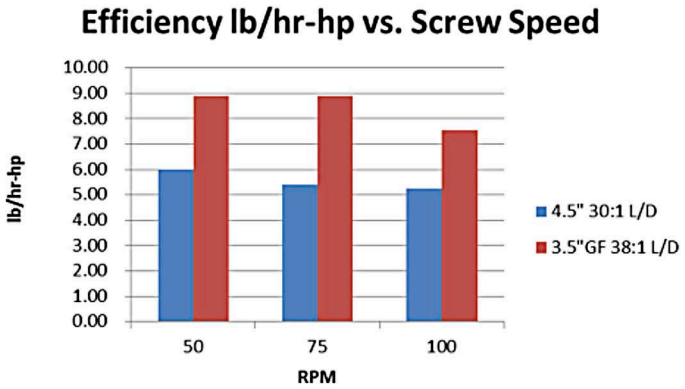


Figure 4. Energy Efficiency vs. Screw Speed – 450 SB and 350 SGF

Energy efficiency is defined by the ratio of the extruder output (lb./hr.) divided by the power input (hp). The unit of the energy efficiency is (lb./hr-hp). Energy efficiency versus screw speed is compared in figure four for each of the designs. A higher energy efficient value indicates a more energy efficient extrusion process. The combination of efficient solids conveying and efficient melting resulted in higher output and lower power input at each screw speed for the 350 SGF when compared to the 450 SB. The more efficient 350 SGF extrusion process resulted in a substantially lower melt temperature.

Conclusion

The selection criteria of process, economic and environmental requirements, including the supplier reputation, clearly demonstrate the 350 SGF is the best extruder platform for this blow molding application.

Process Drivers: The 350 SGF outperformed the 450 SB with a higher throughput rate, significantly lower melt temperature, lower power consumption, improved energy efficiency and shorter residence time at each operating condition.

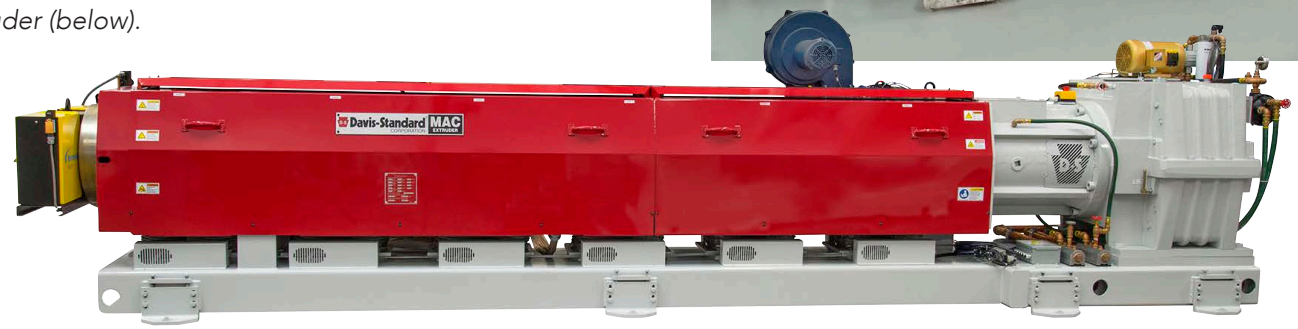
Economic Drivers: The 350 SGF extruder showed a higher performance density (higher output from a smaller size extruder). The capital cost of the 350 SGF will be similar or lower than the larger 450 SB extruder. The higher energy efficiency of the 350 SGF will also decrease operating costs by 11 percent when compared to the 450 SB. The lower melt temperature leads to cooling cost savings and improves cycle times.

Environmental Drivers: The 350 SGF occupies a smaller

foot print and consumes less factory space. The improved energy efficiency will also reduce the amount of heat rejected into the surrounding environment in the plant.

Reputation Drivers: Considering the equipment supplier's reputation and ensuring they have a proven track record will eliminate issues caused by poor process design, resulting in poor performance and higher rates of wear for your equipment. This is especially important when selecting a supplier for a groove feed extruder.

By including key stakeholders in the selection process and using the principles outlined in this article, you will make an informed decision that will positively impact profitability and productivity for years to come. For more information about this topic, contact John Christiano at jchristiano@davis-standard.com. ■



Davis-Standard offers MAC extruders (right) and Thermatic Extruder (below).

Fundamental Approach to Screw Design

By Jeffrey A. Myers, President of Barr Inc.

Introduction

The single stage extruder screw remains as the most widely used piece of equipment in the processing industry today. Advancements in machine controls, drives, heating/cooling systems and screw design have increased the overall machine efficiency but the fundamental function of the single stage extruder screw remains the same. The main functions of an extruder are to:

1. Convey the solid polymer from the hopper.
2. Compact and melt the pellets.
3. Mix the resulting highly viscous polymer into a homogeneous melt.
4. Pressurize and pump the melt through a die.

The function of the extruder screw is the same regardless if it is a continuous Extrusion Blow Molding (EBM) process or an intermittent start/stop Injection Blow Molding (IBM) application. Figure 1 shows a typical EBM extruder.

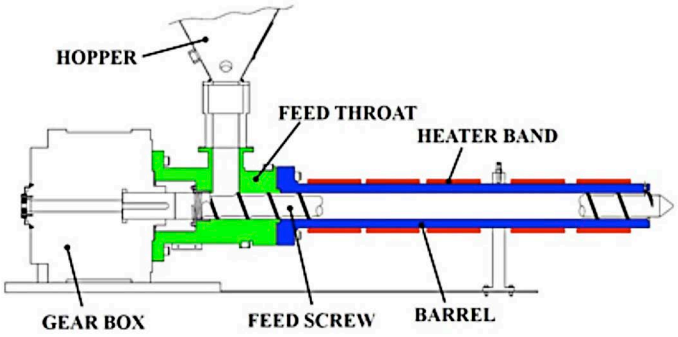


Figure 1: Typical extruder assembly.

Most extruders are defined by the screw diameter (D) and the L/D ratio (Length per Diameter). The length is typically defined as the effective flighted or working section of the screw.

Solid Conveying

Pellets entering the screw from the hopper must be forced down the screw. The feeding mechanism is largely influenced by the frictional forces between the solid pellet and the barrel wall. Because the coefficient of friction (COF) of the pellets acting on the screw surface is less than the COF on the barrel wall the rotation of the screw forces the material forward down the barrel.

Resins that have poor feeding characteristics may require internal screw cooling in the feed section to prevent the resin from sticking to the screw. High polish on the screw root surface also reduces the COF.

It is imperative to prevent early melting in the feed zone, therefore, a path must be maintained, letting the air contained between the pellets escape through the extruder feed throat.

'Grooved Feed Throat' (GFT) technology, which was developed in Europe over sixty years ago, has become more of a standard in providing answers for the most difficult feeding situations, i.e., extrusion of polyolefins. The principle behind a GFT is to create a high friction by mechanically wedging pellets in a series of axial grooves, hence preventing slippage on the barrel. Figure 2. This is a substantial improvement over a smooth bore feed throat (SBF).

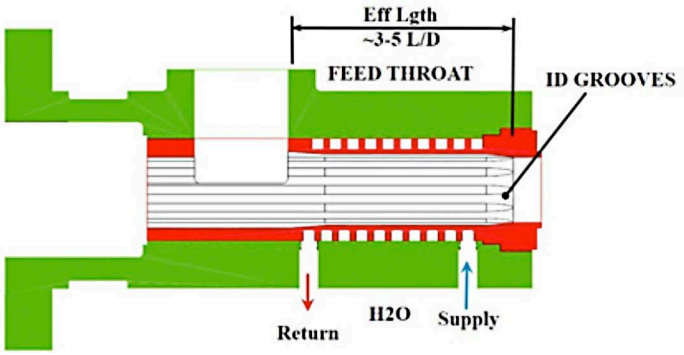


Figure 2: Typical GFT assembly.

The effective length of a typical GFT is between 3 to 5 diameters (pitches). The depth and width of the groove design in Figure 3 is material dependent and the number of grooves is mainly a function of the screw diameter.

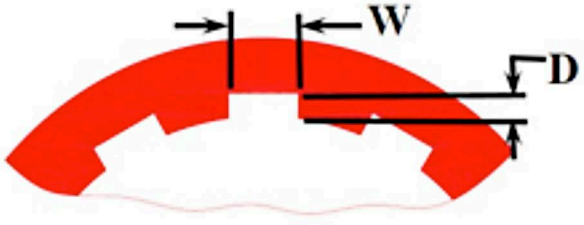


Figure 3: Groove width & Depth.

In order for a GFT to function properly and maximize the solids conveying, good cooling must be utilized. If the GFT

is not adequately cooled, the mechanically generated heat will cause the resin to melt prematurely, filling the grooves with material and reducing solids conveying. A GFT tends to work well with materials that have a high shear modulus and melting point. A properly designed GFT system can improve the extruder output by 20 to 30% over a standard SBF but will require additional power to take advantage of the higher throughput rate.

Extruder Screw Nomenclature

The most common type of single flighted extruder screw, also referred to as a Conventional or General-Purpose (GP) screw, is divided into three distinct geometric sections, as shown in Figure 4.

1. Feed Section (Lf): Constant depth.
2. Transition Section (Lt): Constant taper.
3. Metering Section (Lm): Constant depth.

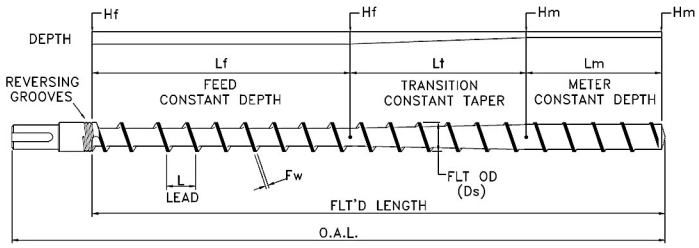


Figure 4: Standard Extruder Screw

The channel geometry for each section is shown in Figure 5.

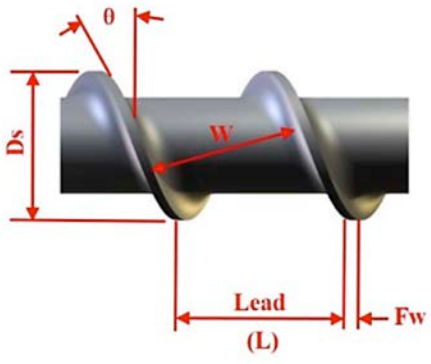


Figure 5: Channel Geometry

The description of each section is defined in the Table below:

Symbol	Description
Ds	Screw Diameter
L	Lead
Fw	Axial flight width
H	Channel depth
θ	Helix angle
W	Channel width

The Helix angle and channel width are calculated using the following expressions:

$$tan\ \theta = \frac{L}{\pi * D} \qquad \text{Eq. 1}$$

$$W = (L - F_w) * cos\theta \qquad \text{Eq. 2}$$

The compression ratio (Cr), is another characteristic typically used to classify GP type screws. The (Cr) is the ratio of the channel depth in the feed section to the depth in the metering section and is calculated using the following expression

$$Cr = H_f / H_m \qquad \text{Eq. 3}$$

Cr indicates the reduction in channel volume between the two sections. Channel volume must be reduced as the density of the melt is much higher than the pellet bulk density, and for developing pressure. The same amount of material occupies much less volume once changed from pellets to melt. It is also used to classify GP type screws. The compression rate (R) indicates the channel volume reduction rate. This rate has a critical influence on melting performance, especially if it does not match the actual melting rate of the resin. The compression rate in the down channel direction is calculated using the following expression:

$$R = \frac{(H_f - H_m) * sin\ \theta}{L_t} \qquad \text{Eq. 4}$$

Where H_f is the channel depth in the feed section, H_m is the depth of the meter channel, L_t is the length of the transition and θ is the helix angle.

Melting

The resin starts to melt on the barrel surface within 3 to 5 L/D's from the feed pocket. The resin is packed into a solid bed at the trailing side of the channel in the downstream direction. The initial melting mechanism of a tightly compacted solid bed is mainly by friction against the hot barrel surface as it rotates with the screw. The function of barrel heating and cooling is to keep the barrel temperature constant, hence maintaining a uniform shear heating and constant melting rate, a critical requirement for establishing a steady state process. The solid bed

melts and forms a thin melt film on the barrel surface. High shear develops as a result of the friction between the solids bed as it rotates with the screw. The formed melt is then scraped off and collected into a melt pool by the advancing flight, as shown in Figure 6. In conventional screws, viscous shear heating is the principle source of energy to melt the polymer.

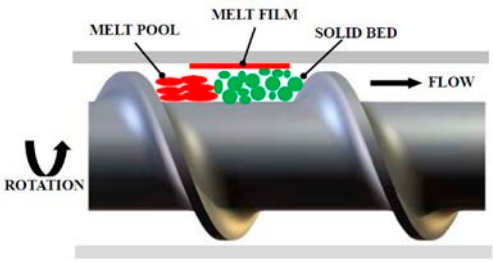


Figure 6: Solid bed formation

The forces pushing on the solid bed will gradually cause a reduction in solid bed width as the melt pool increases, with the progression down the length of the screw. The forces holding the solid bed intact will eventually diminish causing the solid bed to break up. The unmelted polymer fragments could be encapsulated by the surrounding melt, which must now melt by conduction of heat from the melt around it – a much slower melting mechanism. This situation could lead to poor melt quality of the extrudate.

Improved Screw Designs

The General Purpose (GP) screw design will process most resins but frequently not at the melt quality or efficiency required to compete in today's blow molding industry. More modern screw designs utilize a barrier flight as shown in Figure 7.

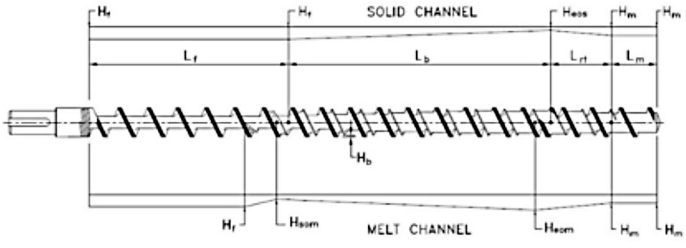


Figure 7: Barrier screw

As the melt film is wiped off the barrel surface by the main flight, the melt is deposited into a separate melt channel. The clearance over the barrier flight separating the solid and melt channels allows only melt to pass, as shown in Figure 8. Removing the melt from the solid bed keeps it from becoming unstable and breaking up prematurely.

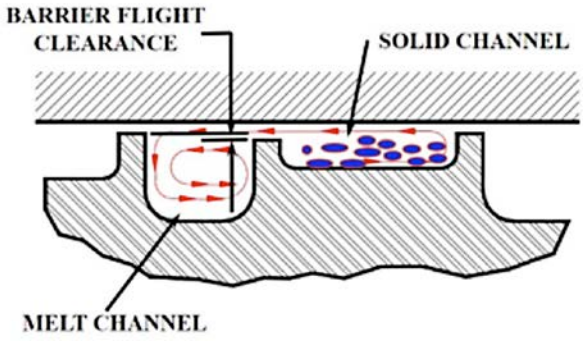


Figure 8: Barrier screw channel

It also allows for a greater solid bed surface area on the barrel wall where shear heating takes place, hence, maximizing the melting rate. Since the melt film thickness is limited, the shear energy generation is increased. However, the corresponding melt temperature is higher, which is undesirable in most applications. Approximately 90% of the polymer is melted by the high shear in the barrier section. A barrier screw is susceptible to solid pellet wedging if the start of the barrier section is not properly positioned to match the melting characteristics of the resin, i.e., if the reduction in channel volume does not match the melting rate of the resin. This could lead to process instabilities, such as, flow surging.

Recognizing the inherent problems and limitations of barrier type screws, the solid/melt dispersion type screws were developed [2]. The original "Wave" screw was patented in 1975 by George Kruder at HPM. The Energy Transfer- ET® [2,3] was developed and patented by BARR and Chung [4] in 1983, as shown in Figure 9.

Figure 9: Energy Transfer- ET®

The principle of these types of screws differs from the barrier designs in that the metering section is divided into two equal sub channels by a secondary flight. The solid bed is intentionally broken up at the end of the melting section to allow some solids to enter the mixing section. The clearance of the secondary flight is much greater than the clearance of the barrier flight on a barrier screw, allowing unmelted pellets to pass through Figure 10.

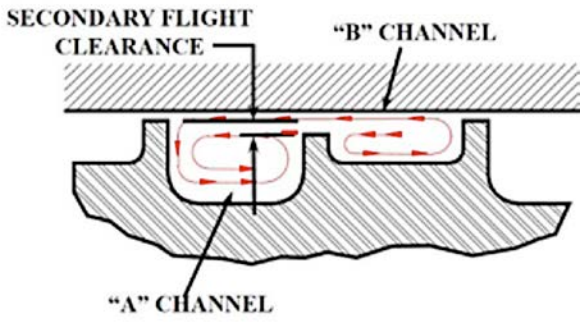


Figure 10: ET® screw channel

The depth of the solid subchannel "A" decreases while the depth of subchannel "B" increases, forcing the melt to flow over the secondary flight at relatively low shear rates. Solid bed fragments are further broken down to yet smaller fragments by passing over the secondary flight. The secondary flight undercut also provides for dispersive mixing. The polymer fragments are continually mixed with the melt promoting conduction of heat from the melt to the pellets for melting. Consuming heat from the melt for final melting of the solid fragments, results in lowering the melt temperature. Additionally, mixing and melt uniformity is improved as well, allowing for an increase in throughput rates at a lower melt temperature. The "Wave" screw and the "E.T." screw were the first designs to utilize this technology. Several commercially available screws utilize this technology.

While the "Wave" and "ET" screws may look similar, the material flow path is very different [4]. In the "Wave" screw, the main flight and the secondary flight are two distinct

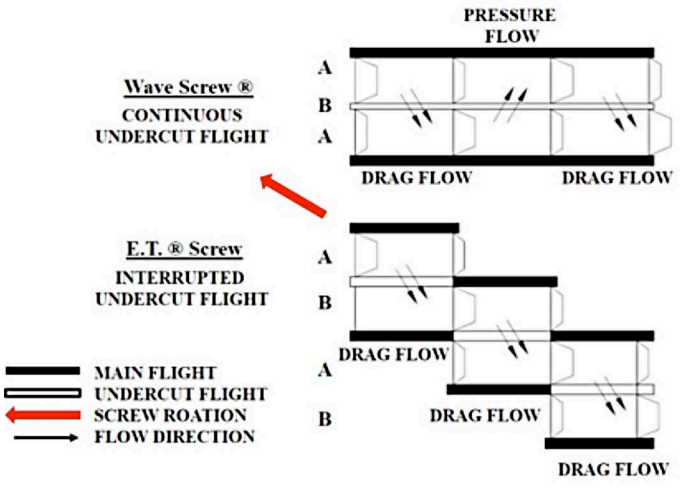


Figure 11: Schematic of the Flow path for the "Wave" and "E.T.®" screws.

and continuous flights. The material is transferred from the discharge side of one sub channel to the adjacent channel upstream channel by the drag flow resulting from screw rotation. The next melt transfer is in the opposite direction of the drag flow, as illustrated in Figure 11.

This requires a high pressure buildup in the adjacent channel to overcome the pressure flow. The results could cause the polymer to stay in the same sub channel instead of flowing over the secondary flight.

In the "E.T ®" screw, the main flight and the secondary flight are interchanged so the melt is always transferred in the drag flow direction. The main flight becomes the secondary flight and the secondary flight becomes the main flight. The secondary flight is not continuous as with the "Wave" screw and allows material to easily transfer from one sub channel to the other in the drag flow direction promoting improved pressure stability and heat transfer.

The Variable Barrier Energy Transfer V.B.E.T. ®[2,5] is the latest generation of the Solid/Melt designs which has proven to yield increased mixing and higher melting capacity compared to the ET® design. The Solid/Melt section depth profile comparison between the ET® and the VBET® section is illustrated in Figure 12.

The VBET® design utilizes a decreasing undercut clearance over the secondary flight and an increasing distance between each series of sub channels. Experiential

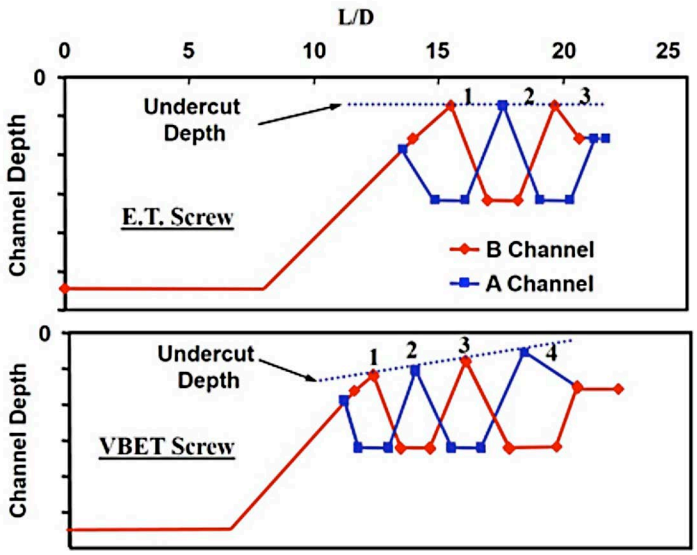


Figure 12: Channel depth for "E.T.®" and VBET® screws

studies [6] have shown that an increase in the conductive melting and heat transfer of the melt to the colder pellets was achieved by varying the length and clearance over the secondary flights.

Conclusion

The goal of this paper was to explain some basic fundamentals in screw design and the different types of feed screws available. It does not encompass all screw designs or the advancements in dispersive and distributive mixing devices. Having a better understanding of the four main functions of the extruder and how each one interacts is the key to a successful process.

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Smart Use of Materials and Regrind Expand Availability and Control Raw Material Costs

By Dan Weissmann, editor for *The Journal of Blow Molding*, SPE Blow Molding Division

The editors acknowledge and thank ***Plastics in Packaging*** *and* ***Plastics Technology*** *magazines for giving permission to use articles appearing in them while composing this article. The articles are: "Expanding the Use of Recyclate", published in* ***Plastics in Packaging****, (Feb. 2017), and "New Tool Helps Blow Molders Manage Regrind Better" published in* ***Plastics Technology****, (Oct. 2017).*

Raw material cost in plastics part manufacturing is usually a large component of part total costs, making material management an important component of meeting cost targets. For various applications, alternate materials, other than virgin, can be considered. Such materials could include: wide specs, recycled, small lots of various grades being dispensed with, as well as internal regrind generated from trim removal and production related scrap. The quality and the properties of the material must always be taken into account not unlike when virgin grade is selected. Additional attributes like repeated heat history effect on properties must also be considered.

Availability of such materials may consist of small lots of various grades within a resin family, not really sufficient for an entire production run. Hence, the ability to combine different material grades to a usable blend is very valuable. To this end ABT (Advanced Blending Technology) has developed the OptiMISER program. Such blending capability also expands the range of materials that can be considered for the mixing.

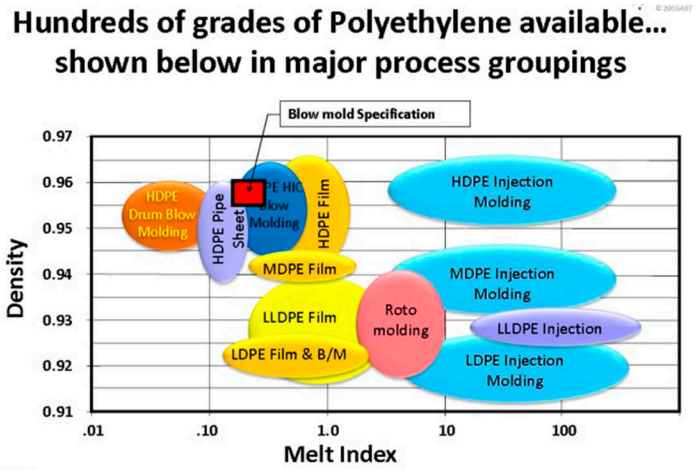
The first requirement, even before the use of alternate materials is undertaken, is an in depth understanding of product performance requirements and the effect that the use of materials other than virgin may have on meeting them. A second requirement is the knowledge of the market for recycled materials and especially any grade suitability for the particular manufacturing process and product.

The world of recycled materials can be grossly segmented into PIR and PCR, post-industrial and post-consumer recycling respectively. As the names imply PIR source is mainly manufacturing operations while PCR refers to materials which have been generated from post-consumer used products. PCR is collected and processed to various degrees, like being separated from other materials in the recycle stream, ground, washed and sometime pelletized.

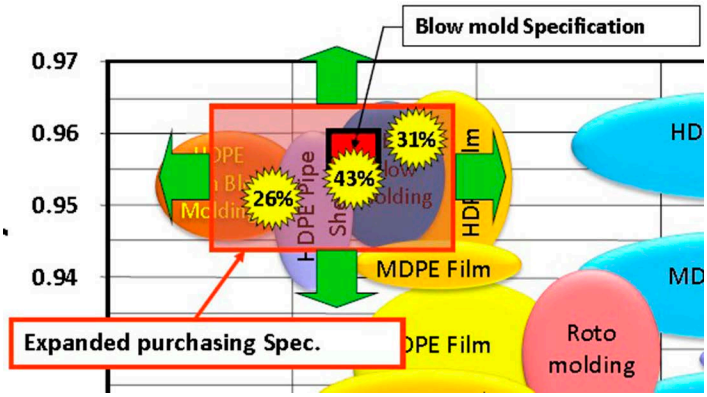
While PIR materials are easier characterized, as their source and specifications may be better known, only limited amount of such materials may be available routinely. Well-designed products, manufacturing processes and equipment, running in efficiently managed plants are unlikely to generate much scrap, or more likely the material is being used within the companies themselves.

PCR – post-consumer recycled materials as collected, are likely to include a variety of resin grades, colors, and various levels of contamination. Contamination can be non-plastic materials or different resins than the one being recycled. Again, availability of any one resin may be limited in terms of quantities, timing and an acceptable cost.

The result is that any sustainable and long term use of alternate content raw materials must expand the reach of suitable materials for procuring. The breadth of grades of Polyethylene is depicted in the following figure with the small area representing the properties target sought. In the box on the next page, the selection domain of materials has been expanded beyond the rather small area of the target. The percent figures illustrate a blend of resins which when mixed will meets the target specifications.



Zeroing on the performance target is accomplished by balancing the quantities of the constituents in the mix

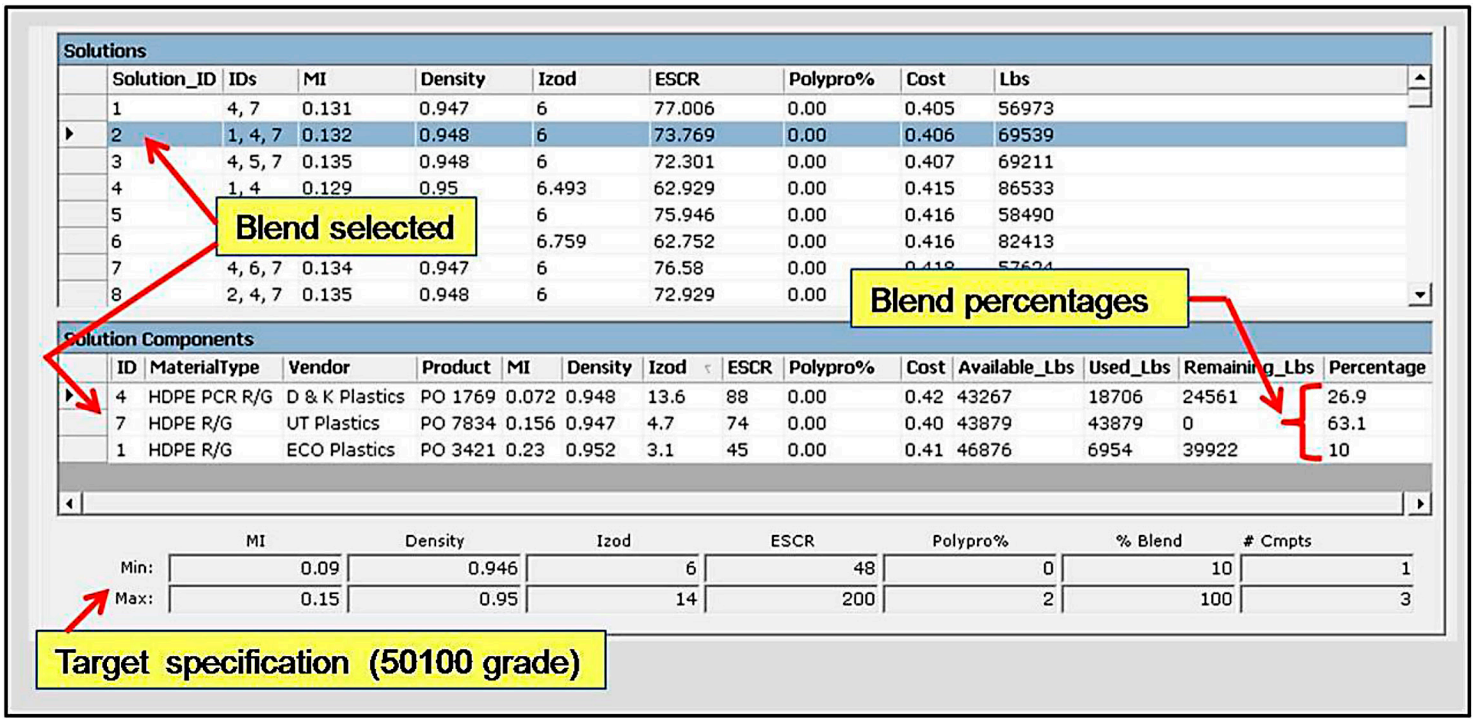


according to their properties. At the same time balancing allows for broadening the range and creating a larger pool of materials to choose from. It also increases the range of possible final blend properties. An added benefit is that the ability to source more diverse resins and recycled materials provide more flexibility in controlling costs. Operationally, the goal is to create a large enough quantity of material to consistently run a complete order.

The current OptiMIZER target is Polyethylene, hence the list of properties discussed are biased to it. Testing will determine, Melt Index (MI) both low and high load, density, which in case of Polyethylene is indicative of stiffness and tensile strength, impact strength and contamination levels, including Polypropylene content. (Polypropylene is a major contaminant in PCR Polyethylene. Only small amounts of polypropylene can be tolerated in Polyethylene blends without adverse effects.) The blending program can manage up to seven material properties.

Inputs into the program are the available data for each resin which is entered along with the quantity on hand and cost. As it is very important to start with reliable information for the available resins such data is best generated by testing rather than relying on information available from the material purchase, hence, in house testing capability is preferred. Incoming materials are characterized in accordance with understood and established standards as required by the program. Whereas the inputs needed are for the base resins, care must be exercised to account for property changes due to additives, like color. Color is likely to raise the density of the material however would not affect stiffness as might have been anticipated from a higher density measured.

When looking to create a blend for a given run, the desired blend properties, in the form of a range, are selected along with the quantity of materials needed for a particular production run. The program, using built in algorithms, will then display several combinations of on-hand resins that can be considered. Further details are provided which indicate the blending ratio recommended for each combination. Total cost is derived and displayed based on the level of each component in the mix and its cost basis.



The program can be set up to limit the level of any blend component and obviously one of the components can be either wide spec or first quality resin.

The figure below is a typical program display showing several blending options against the targeted specifications shown on the bottom. The detailed data defining the selected blend is listed in the lower part of the main window.

Many times, blending is done with a machine mounted blender to feed material directly into the process. In practice, this may constrain the number or different feed materials that can be used at one time. Off line pre-blending, where the number of components is not really limited, is another option. (It may result in some additional cost.)

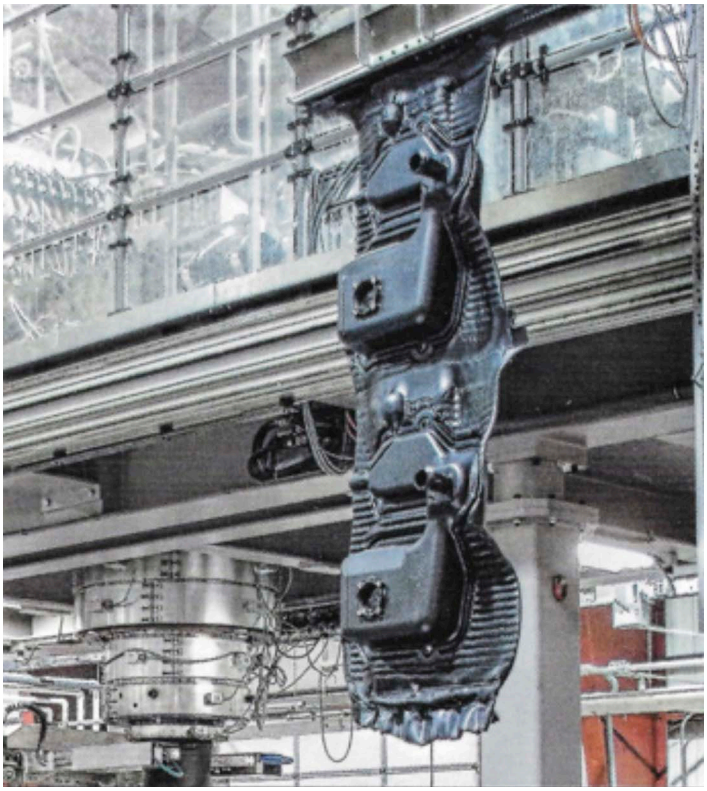
For the system to successfully work, a certain level of material inventory must be available on-hand with the appropriate range of each of the properties. Depending on available quantities, a single blend formula can be established for an entire run or several mixes must be used during the production run period.

Licensing the OptiMISER program from ABT includes the company supporting set-up of the recycled content use system. Along with training for use of the computer program, help can be provided in setting up the material testing laboratory, as well as training in the proper testing procedures and test conditions.

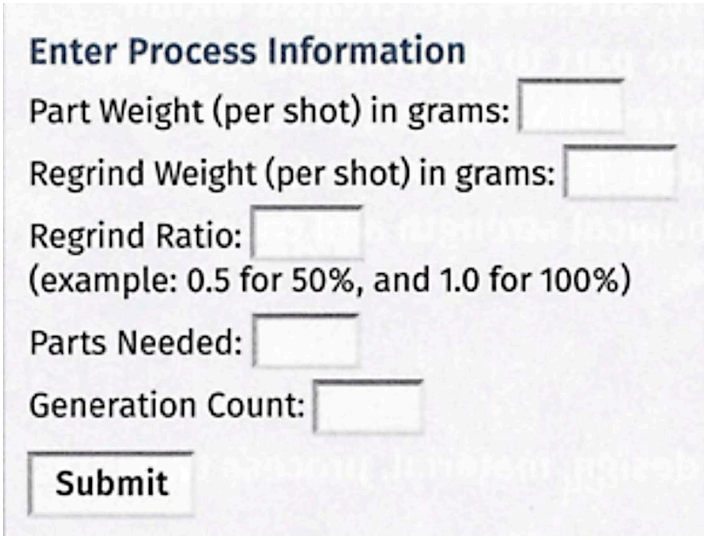
The second article also offers a computation program, the goal of which is to minimize virgin resin use by determining when to start feeding regrind back into the process Returning regrind into the ongoing production usually carry the highest value for the material. It also reduces the amount of material left over at the end of the production run.

Trim scrap is typically being generated in extrusion blow molding where parison is pinched off and must be trimmed or punched out. The quantity of trim can be small, in relation to the overall shot size, when blowing large containers and becomes significant when manufacturing small bottles. Frequently in industrial blow molding the trim quantity exceeds the net part.

The repeated use of regrind by being fed back into the



process must be restricted, because with every heat history, melting, a certain level of degradation occurs. While material generation 0 is the virgin, each successive generation indicate one more heat history. It is very important to establish, before starting any production, the highest material generation allowed to be used for a product so performance is not compromised.



The program relies on an algorithm developed to determine the precise cycle in the production that regrind material should start being added back into the process,

and at a prescribed ratio, explains Gary Turell, president of Mountain Packagers of Wellington, CO , who developed the program. That way, when the run is completed, the last parts were made from the highest generation of allowable regrind.

As shown in Fig. 1 the algorithm requires the operator to enter five inputs.

FIG 2 Virgin Needed: 28,131 lb; Switch Cycle: 3988

Generation	Regrind Made in Previous Generation, lb	Virgin Needed, lb	Cycles for Generation	Cycle Count
Generation 0	0	28,131	3988	3988
Generation 1	17,582	0	2492	6480
Generation 2	10,989	0	1558	8037
Generation 3	6868	0	974	9011
Generation 4	4293	0	608	9619
Generation 5	2683	0	380	10,000
Waste, lb	1677			

FIG 3 Virgin Needed: 38,408 lb; Switch Cycle: 888

Generation	Regrind Made in Previous Generation, lb	Virgin Needed, lb	Cycles for Generation	Cycle Count
Generation 0	0	6266	888	888
Generation 1	3916	3916	1100	1998
Generation 2	4895	4895	1388	3386
Generation 3	6119	6119	1735	5121
Generation 4	7649	7649	2168	7290
Generation 5	9561	9561	2711	10,000
Waste, lb	11,952			

The Regrind ratio limits the maximum amount of regrind allowed back into the raw material feed mix.

Figure 2 shows a typical output from the algorithm using the following inputs:
Part weight: 1200 g
Trim weight per shot: 2000 g
Total shot weight: 3200 g
Regrind Ratio: 100%
Parts needed: 10,000
Generation count: 5

To minimize the use of virgin resin, the operator is instructed to switch to 100% regrind being generated from the immediately preceding production, at the ratio selected in the data input step, after cycle 3988, Fig 2. Was the ratio set at 50% regrind addition, equal amounts of virgin and regrind feed would have started after cycle 888, Fig. 3. The 1:1 mix would have been repeated for each material generation.

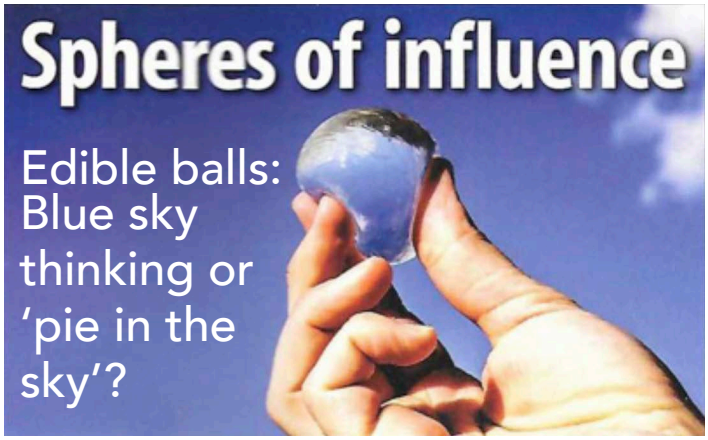
It is important to note that the total virgin resin consumption jumped to 38,406 from 28,131 lbs. when the regrind use was restricted to 50%. Also, at the end of the run 11,952 lbs. of regrind are left at 50% mix where only 1,677 lbs. for the 100% run.

Having a regrind with a known history could possibly make it more valuable when sold in the secondary markets, as it can be used more reliably for more demanding performance requirements.

The program, which was converted to the PHP language, is accessible free of charge at the company web site: mountainpackagers.com/regrindcalculator.php. Turell is also in the process of developing an app, as well as an algorithm for extrusion.

In the book *Practical Extrusion Blow Molding*, edited by the late Sam Belcher, information was provided on determining the content of each generation of regrind in ongoing mixed feed of virgin and regrind. At low regrind ratios the content of forth generation regrind or higher is calculated to be cumulatively less than 1% of the total feed, (page 192).

There is no question that the systematic approach and the tools offered make it easier for any company to facilitate and maintain a successful manufacturing operation which optimized the use of alternate/recycled materials. Successful use of materials not only improves the cost basis, it also contributes to sustainability efforts and reduces impacts on the environment. ■



From Michelin Star restaurants in London developing a twist on an old apple crumble recipe, to rolling dog treats, edible balls are in vogue. In fact, several industry contacts and colleagues forwarded me a particular news story recently, convinced it would bowl me over. Shock headlines accompanied the news, such as 'will this spell the end of the plastics bottle market?' Yet I was left with a definite feeling of déjá vu.

The story is about an edible (bio) water ball called Ooho!, which aims to reduce the use (and waste) of plastics used in traditional water bottles through its 'edible hydration' format. For shock value, the news release promptly points to the one billion plastics bottles a year that reach the ocean and the 300 million kilograms of carbon dioxide that could allegedly be saved. From a technical perspective, the ball is made of algae and is said to be completely edible. The consumer pops the water-filled sphere into their mouth or can pop it first and consume the contents separately. My obvious first question was 'what will it be packaged in to reach the consumer?' Skipping Rock Labs, the London-based seaweed-tech start-up behind Ooho! says that the balls could be sold in a pliable outer packaging (whatever that means!), while the question of safely distributing these 'poppable' balls also remains unanswered. Without any secondary packaging, the thought of consuming an edible ball from a pile of edible balls alongside fellow consumers leaves one wondering if you're placing your hands into a soup of bacteria. That would definitely bring new meaning to the phrases 'gone viral' or 'viral sensation'.

The reason for my Groundhog Day moment is that edible balls are hardly a new invention. I remember writing about Wiki Cells (not to be confused with WikiLeaks!) as long ago as five years, and as my journalist friend Ben Miyares added that "the idea of edible packaging has been a recurring regurgitation since Earth Day was first celebrated on April 22, 1970" (hats off to Ben for the use of the term 'regurgitation' in this context:.

WikiCells' also known: as WikiPearls, which was the first commercial iteration of WikiCells) was developed by Harvard professor David Edwards who had previously developed a method for delivering drugs inside porous waffle balls of inhalable insulin (inventive chef Heston Blumenthal has probably taken note!). It works on the theory that electrostatic charges can transform a sugar processing bi-product called bagasse, mixed with chitosan and alginate, into an edible shell membrane.

Regular readers will recognize bagasse as a source of bioplastics, while chitosan (from crustacean shells) and alginate have both appeared as potential sources of packaging materials in scientific articles that we have published over the years. Edwards claimed that the shell could be peeled off the product and composted like a banana peel.

In order to appeal to the consumer by providing a recognizable treat, Edwards was keen to develop concepts such as orange- like membranes for orange juice, an espresso shot inside a chocolate skin {now Tm interested), or even fudge membranes for ice cream. In 2013 Edwards, who raised $10 million in venture capital to develop WikiCells, was convinced that brands would adopt edible packaging over the next few years.

Inevitably, packaging film technology firm MonoSol, well-known for its water soluble films for products such as washing detergents, developed its own solution a few years ago in the edible delivery systems area, called Vivos Films. The dissolvable pouches can be used for products that can be combined with liquid such as oatmeal, cereal, soup and instant coffee, with the pouch melting away to leave nothing. Not so much edible as 'dissolvable' {or are they the same thing?).

A spokeswoman for MonoSol explained that, most recently. Vivos films have been used by Pacific Shaving Company for delivering shaving cream in pre-measured pouches that release their contents when exposed to water.

In June 2016, MonoSol partnered with Dicoisa, a supplier

of color additives to package and deliver food colors to processors in Latin America. The pre-measured ingredients enabled foodservice kitchens and food/beverage manufacturers to improve their mixing and product consistency.

Recent years has also brought us the edible burger wrapper from Brazilian burger chain Bob's (material structure unknown), and an edible meat coat with antimicrobial film from UK research firm Pepceuticals that was designed to replace vacuum-sealed packaging.

Last year we even had an edible cling film made from milk protein doing the news rounds, which was claimed to be 500 times better than plastics at fending off oxygen for Eve. Made from casein, it was also biodegradable. The US Department of Agriculture was behind that research, with claims that product would be available by 2019.

Back to WikiCells, organic yogurt giant Stonyfield Dairy (in Connecticut, USA), linked up with WikiFoods a couple of years ago to produce bite-sized frozen yoghurt balls, which were surrounded by a gel-like edible skin made of fruit or coconut particles and a seaweed extract. It tasted sweet and was used for a marketing campaign by Stonyfield Dairy, which is currently being sold by Danone as part of the French dairy giant's acquisition of WhiteWave. And, for the record, the balls were packed four to a flexible film pouch {hmmm).

When people refer to edible packaging like this as a threat to plastics, I remain unequivocally skeptical. Fruit and vegetables, for example, which are already in their own skin, are the foods that spoil most quickly, which is why we see them so often secondary packaged. Simply swapping plastics for edible packaging could ultimately lead to more food waste. Otherwise, these edible materials might be restricted to the frozen food aisle.

Granted, the edible water balls in the promotional photos look space-age and awe-inspiring - although the similarities in appearance with inedible washing detergent ball/capsules is worrying (if you have children!) - but they seem a bit 'pie in the sky' to me.

'Waiter, I want pie in the sky, served in an edible chitosan and alginate ball please?' Expect to see it on the menu of one of Heston Blumenthal's restaurants soon!

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How To Change Plastic's 'Waste' Reputation

By Chandler Slavin, *Sustainable Packaging*

An environmentalist and a plastics representative walk into a bar. The environmentalist says, "Plastic is killing the planet." The plastics representative responds, "But plastics save resources by being so efficient!" They roll their eyes at one another and sit at opposite ends of the bar. And so continues the Great Plastics Divide.

Can the differences ever be reconciled? Let's look at each perspective and, yes, some possible solutions.

Plastic has long been targeted as demonstrative of our throwaway society, our culture of excess, of waste. This image of plastics is so prevalent that you see it in contemporary art. Brooklyn-based artist Dana Bell recently thermoformed bio-plastic art as critique of our contemporary modes of production and consumption. Her project abstract reads:

"My newest body of work is based on the problems of production found in fast fashion, limited-use furnishings/ decor, and commercial packaging. Using the very tools, materials and techniques behind the modalities of mass production, I am creating sculptures, paintings, and photographs. In doing so, I seek to develop a body of work which speaks in critical dialogue with over-production, over-consumption, and the disposable desire that holds accumulative manufacture together, and propels the system of proliferating waste…By re-contextualizing the materiality of waste and industrial byproducts and transforming the detritus into intentional art objects, I aim to focus attention upon, and to denormalize escalating waste culture."

Dana Bell's algae-plastic thermoformed art looks to challenge our "waste culture" by using the very technologies of mass production to create decomposing art. Material provided by Dordan via ALGIX LLC.

But #plasticsmakeitpossible proponents tweet alongside stories of how plastic packaging protects food the longest,

reducing spoilage. Natural capital accounting firm TruCost supports these arguments, finding that plastics are in fact the preferable environmental material when compared with alternatives intended to perform the same function. But when has science ever trumped public perspective? Take the plastic shopping bag—a waterproof, durable, lightweight packet capable of holding more than a thousand pounds its weight, soon to become a relic of modern convenience, thanks to bag bans aimed at its eradication.

Thus, plastics making it possible doesn't replace the powerful images of albatrosses with plastic debris in their decaying stomachs, or children in India sifting through mounds of plastic garbage; it doesn't change the economics of recycling, where much post-consumer plastic is of too little value to recover; and it doesn't help position the industry toward a sustainable future where plastics is regarded as the true engineering marvel it is, not the environmental burden it is perceived to be.

Some argue that plastic isn't the problem: people, policy and/or waste management schemes are. If we facilitate more recycling at the municipal level, and encourage the responsible disposal of plastic at the behavioral level, through education, incentives and investment in the recovery infrastructure, then we won't see plastics in our waterways or landfills.

These remedies to the problem of plastic waste, though helping to move the needle, are too granular. Even if all of the best practices were sophistically implemented, it would not fundamentally change the public's perception of plastic, because it would not solve the global problem of plastic waste.

What is the solution then?

The solution to the war of plastic ideologies becomes clear. The sociological construction of plastics as symbolic of waste culture—communicated through Bell's art—will only be replaced with proper representation, when the global problem of plastic waste is tackled. Perception is power, and the perception of plastic can't oscillate between good and evil, but fall on the truth.

The economy of waste is not divorced from capitalism. In the majority of America, waste management is funded by taxes and managed by municipalities. In countries with Extended Producer Responsibility programs, however, industry funds waste management and private companies compete for the management of the waste. America's plastic recycling rates have stagnated while countries with EPR boast high plastic recovery and recycling rates. Economics and policy therefore dictate the success of waste management.

But it's not as simple as who pays or how it's managed when we are talking about eradicating global plastic waste.

Years ago I wanted the thermoformed packaging that Dordan makes to be recycled. I didn't understand why, if it was made from recycled water bottles, it couldn't be recycled with plastic water bottles. I wasn't alone.

The price for virgin plastics was high, there was more capacity and demand for recycled polyethylene terephthalate (rPET) than supply, and Walmart released its infamous "Packaging Scorecard." Industry alliances, recyclers, brand owners, producers and non-profits all championed for the recovery of thermoformed plastic packaging. The argument was PET thermoformed packaging could and would be recycled post-consumer if: (1) there was enough quality and quantity in the post-consumer waste stream to economically justify the collection and reprocessing of it; (2) it could be efficiently and affordably sorted at the recycling facility from look-alike containers, like polyvinyl chloride (PVC) clamshells; (3) it wouldn't contaminate the existing PET water bottle recycling stream; and (4) there was a sustainable and consistent demand for the recyclate.

Thanks to the hard work of a lot of people, all the moving pieces came together, and it was reported in 2012 by Moore Recycling Associates that PET thermoformed containers are now "recyclable" insofar as the majority of American communities have access to facilities that can reprocess the material.

What's the recycling rate of PET thermoformed containers today? Not terribly impressive. That's because the cost of virgin plastics dropped, the reprocessing was found to be challenging, and the economics and initiatives that catalyzed the collection and recovery mostly disintegrated.

This story provides a snap shot into the complexities of the economics of recycling plastic packaging in North America.

The recycling market is in a constant state of flux depending on an array of factors that continuously ebb and flow. Countries with EPR, hands down, are the most proficient at recovering waste, but that is because of fundamental differences in consumer attitudes and governmental structure and funding. If the majority of ocean debris comes from the same four countries in the southern pacific that lack basic waste management infrastructure, then it is extremely doubtful that said countries can fundamentally change their culture and politics to implement EPR to stop the leakage of plastics into the oceans.

What is changing now?

The New Plastics Economy is a global initiative looking to eliminate plastic waste through innovation and collaboration. Spearheaded by the Ellen MacArthur Foundation and joined by an impressive alliance of companies, philanthropists, governments and non-government organizations (NGOs), the NPE is a concept rooted in a 2016 report by the World Economic Forum and the Ellen MacArthur Foundation, with analytical support from McKinsey & Co. Titled The New Plastics Economy—Rethinking the future of plastics, the report provides the vision of a global economy in which plastic never becomes waste.

The report illustrates a disconnect between the value of the plastic packaging we produce and use and its associated value after use. Because there is little post-consumer value associated with much plastic packaging, there is little economic impetus to collect and recycle it. Thus, the majority of plastic packaging remains outside the circular economy model, making its way into the natural environment and persisting in our waterways and oceans.

Susan Freinkel's 2011 "Plastics: A Toxic Love Story" was ahead of its time. In it she notes this inherent economic disconnect of plastic. She writes, *"We are burying the same kinds of energy-dense molecules we spend a fortune to pump from the ground, scrap from mines, and blast mountaintops to reach. When we put these previous molecules into products we designed for the briefest of uses, we inevitably lose sight of their worth. We forget that an item like a used soda bottle is an item worth saving, not trash to be thrown away."*

Art is a barometer of society, its manifestations are glimpses into the cultural imaginations of a time and place. The sociological construction of plastics as representative of waste culture can be replaced, but it requires changing the economics of plastics such that plastics never become waste.

Instead of those in the industry inadvertently taking to the defense of plastics by focusing only on its success stories, all should acknowledge the global problem of plastics pollution, and learn intimately of the initiatives underway. Knowledge is more powerful than perspective when spread eagerly, so lets use our media platforms to share the new plastics economy initiative. On the vehicle of an informed populous, the opposing ideologies of plastics can finally come together, and toast to the sustainment of both the industry and the planet.

Let's rally together behind the new plastics economy, because no one wants to drink alone.

Chandler Slavin is the sustainability coordinator and marketing manager at custom thermoforming company Dordan Manufacturing. Privately held and family owned and operated since 1962, Dordan is an engineering-based designer and manufacturer of plastic clamshells, blisters, trays and thermoformed components. Follow Slavin on Twitter @DordanMfg.

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- Article length:1,000 - 2,000 words. Look to past articles for guidance.
- Format: .doc or .docx Artwork: hi-res images are encouraged (300 dpi) with appropriate credits.

Send all submissions to George Rollend, Editor, at grollend@dakamericas.com

Proctor & Gamble Partners With Terracycle to Boost Recycled Content

By Ben Messenger

Procter & Gamble Company has launched Fairy Ocean Plastic bottle, made entirely from post-consumer recycled plastic and plastic recovered from the ocean.

Consumer goods giant, Procter & Gamble, has launched Fairy Ocean Plastic bottle, made entirely from post-consumer recycled (PCR) plastic and plastic recovered from the ocean.

The launch of the bottle aims to raise awareness of the issue of ocean plastic and what can be done to prevent plastic waste from reaching the ocean. The first-ever Fairy Ocean Plastic Bottle has been created in partnership with recycling expert TerraCycle and will reach British consumers in 2018. In the UK, the launch will include 320,000 bottles, the largest production run of recyclable dish soap bottles in the world made using ocean plastic.

The innovative bottle will be made from 10% ocean plastic, collected from the ocean and beaches around the world, and 90% post-consumer recycled plastic.

The project aims to drive awareness of the issue of ocean plastic pollution, inspire consumers to physically participate in beach clean-ups, and recycle household waste.

Stemming the flow of plastic into the ocean is crucial to preserving the health of our ocean. According to the Ellen MacArthur Foundation (EMF), 95% of the value of plastic packaging material, worth $80-120 billion annually, is lost to the economy and on the current track, there could be more plastic than fish in the ocean (by weight) by 2050[1].

In an effort to divert plastic waste from landfill and the ocean, P&G brands, including Fairy, Dawn, Yes, Dreft and Joy, will continue to divert 8000 metric tonnes of plastic from landfill for use in transparent plastic bottles, using an average of 40% Post-Consumer Recycled plastic content across 481 million transparent dish care bottles globally. The company said that if stacked, these bottles would be 11 times the height of Mount Everest.

"As the world's no. 1 dishwashing liquid globally and a much-loved brand in the UK, we want to use Fairy to raise awareness about the plight of our oceans and raise awareness about the importance of recycling," commented Virginie Helias, Vice President of Global Sustainability at Procter & Gamble.

Tom Szaky, the CEO of TerraCycle added: "The issue of ocean pollution is a pertinent one, we hope other brands will be inspired to think creatively about waste and make the circular economy a reality."

Susan Ruffo, Managing Director at Ocean Conservancy said: ''We are excited that in addition to its work to reach consumers directly through the Fairy bottles, they {P&G} are also addressing the source of ocean plastic by supporting our initiative to raise over $150 million over the next five years to improve waste collection, sorting, and recycling in key ocean plastic economies."

"Improving waste management in these places can help cut the flow of plastic going into the ocean by half by 2025," he concluded.

1. More information available at https://www.ellenmacarthurfoundation.org

Waste Management World is the official magazine of the International Solid Waste Management Association (ISWA). ben@wmw.news | +44 7917 566259

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Where do our polymers come from?

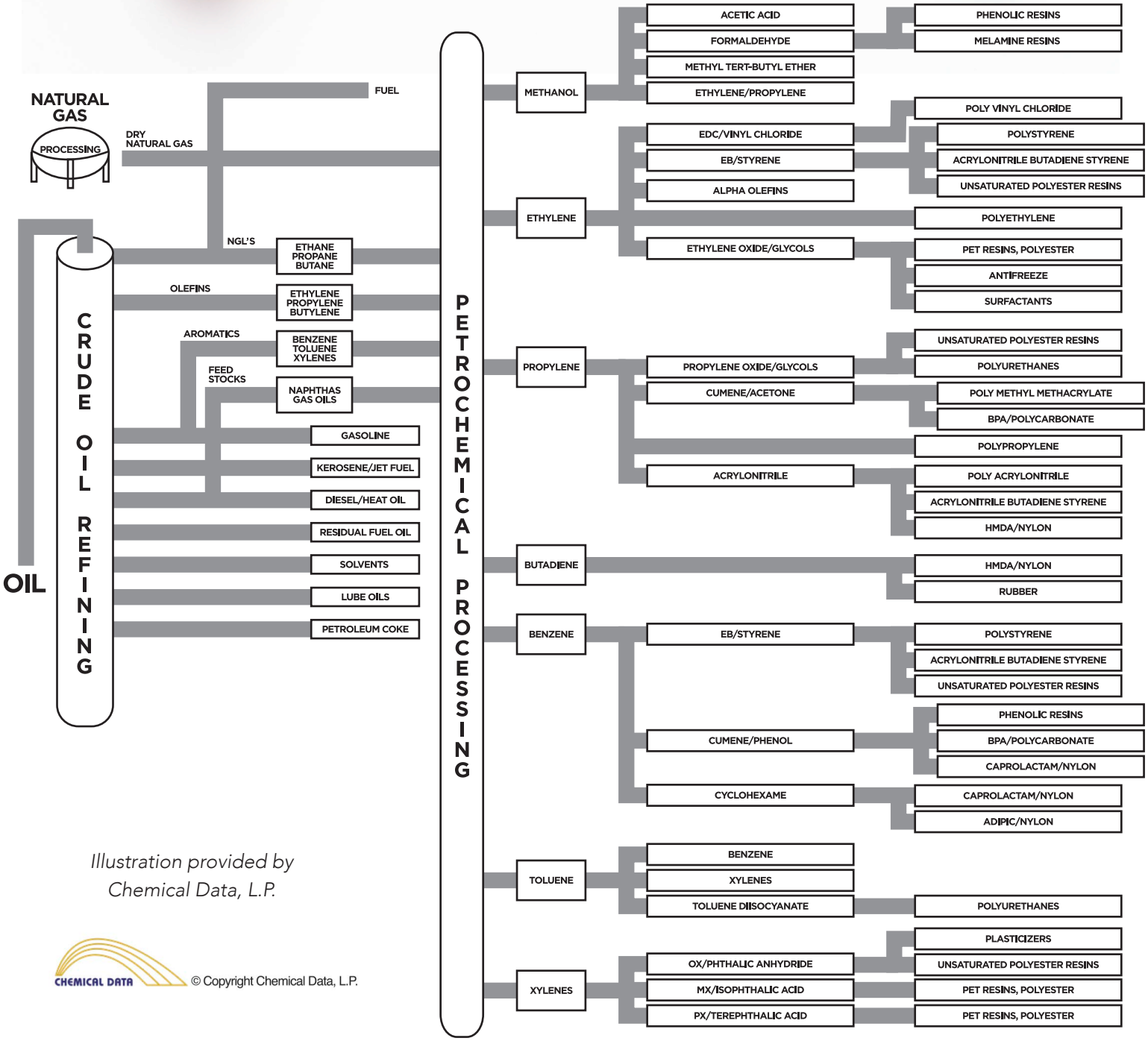

Illustration provided by Chemical Data, L.P.

CHEMICAL DATA

Alpha Packaging Buys Plant in Europe from Graham Packaging

By Roger Renstrom, *Plastics News*

Custom blow molder Alpha Packaging Inc. added to its European footprint in acquiring a plant in Etten-Leur, the Netherlands, from Graham Packaging Co.

The transaction was completed on Nov. 2. No terms were disclosed.

The 162,000-square-foot facility includes production space, an on-site warehouse and offices. The Etten-Leur plant employs 63 and operates 21 injection stretch blow molding machines, all for processing PET primarily for rigid packaging for food products such as peanut butter and condiments.

Graham Packaging of Lancaster, Pa., constructed the Etten-Leur facility in 1988 and substantially expanded it in 1991.

The Etten-Leur facility has received a grade AA certification for the BRC-IoP Global Standard for Packaging and Packaging Materials.

"The acquisition more than doubles our production capacity on the continent making Alpha one of the largest single stage blow molding operations in Europe," Jeffrey Kellar, president and CEO of St. Louis-based Alpha, said in a statement.

The acquired plant is a few miles from Alpha's existing European facility in Roosendaal, the Netherlands. Alpha established launched Roosendaal as a greenfield site in 2010.

Now, the Roosendaal plant occupies 45,000 square feet, employs 45 and operates 15 PET injection stretch blow molding machines primarily for nutritional supplement packaging. Warehousing is off-site. That plant is achieving double-digit year-over-year growth.

In addition to the two sites in the Netherlands, Alpha operates eight manufacturing facilities in North America. Alpha blow molds PET and high density polyethylene bottles and jars for consumer markets, including the nutrition, pharmaceutical, personal care and niche food and beverage categories.

Phil Yates, Irving Place Capital senior adviser and Alpha Packaging Chairman.

Alpha has a broad portfolios of stock bottles and jars along with custom bottle design and development capabilities and in-house mold making talents.

Irving Place Capital, a New York-based middle-market private equity firm, owns Alpha.

"The acquisition is consistent with Alpha's strategy of acquiring successful businesses with complementary customer relationships, product lines, manufacturing technologies and plant locations," said Phil Yates, Irving Place Capital senior adviser and Alpha chairman.

New Leader Taking Over U.S. Operation of W. Müller

By Bill Bregar, *Plastics News*

There's a changing of the guard at W. Müller USA Inc., the Agawam, Mass.-based unit of the German maker of blow molding extrusion heads for blow molding, where longtime industry veteran Wolfgang Meyer will retire at the end of the year.

Jens Schlueter will be the new general manager of the U.S. operation. But this is not the type of transition where the outgoing person says to the new guy, "Here's the keys, good luck!"

Meyer and Schlueter, who is new to the blow molding industry, have spent more than a year in the transition.

Schlueter is a quick study, and he's a German with industrial management experience in the United States, but he values the time spent with Meyer.

"That's the greatest thing which would happen to me," he said at the Society of Plastics Engineers' Annual Blow Molding Conference, where Müller exhibited. "First of all, blow molding is very special. I'm not from the industry. I hope, of course, to add value with my former experience. But having someone like Wolfgang, I would say, not only a boss but also as a mentor, to bring me into this was a great thing."

Meyer, who had retired from the machinery world and ran his own consulting business, stepped into the position at W. Müller USA after the death of Elmar Spohr, the former president. Spohr was only 40 when he passed away from an aortic aneurysm on the first day of the 2010 K show. Meyer came to the booth and volunteered for the post.

Christian Müller, managing director of W. Müller GmbH, said the company was lucky to have an experienced executive step in on an emergency basis. Meyer had been president of blow molding machinery supplier Kautex Machines Inc., and he retired from that post before the Müller opening. He knew blow molding. Before Kautex, Meyer was the longtime president of Battenfeld America Inc., the injection molding press company.

Meyer's career started at Bayer AG, right after college, working in polycarbonate and the then-booming area of structural foam molding of computer housings.

After Spohr's untimely death, Meyer signed on for a year, but that was extended several times. Finally, Meyer told them he wanted to phase out at age 70. (He turned 71 on Oct. 27.)

Christian Müller said it took much longer than expected to find someone good.

"After we tried ourselves to find our somebody from the industry, we hired a recruiting company," he said. The company found some candidates with blow molding or tooling experience, but none were the right fit.

Extrusion die heads for blow molding is "not an out-of-the-catalog product," Müller said. "When with the customer, you need to identify the problem, and then you need to know what is the right product and the right solution. That's the difficult thing about it. So we had a hard time to identify the right candidate. But at the end, we decided for Jens because he was not out of this industry. Just to get fresh ideas. What we looked for was the technical skills. Would he be able to catch up? And from the first interview we were confident that he will learn quick. But then bring also his own ideas."

Schlueter officially started in September 2016. His first public event was the 2016 blow molders conference, where he was recovering from a broken foot in a motorcycle accident.

Schlueter started out as a tool and die maker in Germany, after doing an apprenticeship. While working, he went back to college to get a degree in mechanical engineering, attending classes on Fridays and Saturdays for eight years, he said.

He took the position of president at Plymovent GmbH, a maker of industrial air filtration equipment, and after four years in Germany, he moved in 2011 to the company's U.S. operation in New Jersey as president and director of sales, and later global vice president.

"It was a three-year assignment, and then after two years, my wife and I decided that we wanted to stay longer. We applied for green cards," he recalled.

In 2014, Schlueter became president of Norres NA, doing a greenfield startup in South Bend, Ind., for the German maker of industrial hose systems, the kind used, for example, in the plastics industry for hopper loaders and conveying systems. Then he came to W. Müller.

Schlueter took on the top U.S. job of general manager from Meyer in July. He appreciates the long break-in period and has enjoyed learning the ropes from Meyer. "He's a great door-opener. We traveled a lot," he said.

Meyer said the two men "have traveled quite a bit and visited customers from Canada to Argentina together. And introduced Jens to our customer base, so he is familiar with issues that customers have, the requirements they have."

2017 Carrie Fox Solin Memorial Scholarship Awarded

Alison Davidson has been awarded the SPE Blow Molding Division's 2017 Carrie Fox Solin Memorial Scholarship in the amount of $3000. She was chosen for this award by the division's scholarship selection committee based on her outstanding record of academic and extracurricular achievements.

Alison is a Senior studying at Pittsburg State University in Pittsburg, KS. She expects to complete her degree in May of 2018 with a B.S. in Plastics Engineering Technology and a minor in Physical Science. She is an active member in her Student Chapter of Society of Plastics Engineers and is on the executive board as the Vice President. Other prominent organizations she is involved with include Society of Women Engineers, and Cru where she serves as a student leader and Treasurer. Alison also works on campus in the Engineering Technology office where she gets to assist professors, fellow classmates, and help prospective students who are interested in the engineering technology programs at Pitt State.

During the summer of 2016, Alison experienced an internship at Yanfeng: Automotive Interiors as a product engineering intern in Holland, MI. She was involved with projects in many different stages of completion, which included innovation in designing a product, testing parts before production, and fixing a current problem in production. Then for the summer of 2017, she invested her summer on a ten-week Summer Mission with Cru in San Diego, CA. There she was involved in outreaches around the San Diego community, leading small group discussions, as well as planning and leading with her ministry team. Alison's ambitions for the future include earning Magna Cum Laude, a University Scholastic Honor, and upon the completion of her degree to join the Plastics Industry in a job she has a passion for and can express her talents.

The Blow Molding Division of the Society of Plastics Engineers awards its annual Carrie Fox Solin Memorial Scholarship(s) to selected students enrolled in plastics engineering programs. Since inception of the scholarship program, the SPE Blow Molding Division has awarded $266,500 to 41 students enrolled in programs that include curriculum pertaining to blow molding.

The Blow Molding Division's scholarships and other educational support programs are funded with the income from a $216,000 Grand Fund endowment that has grown over time with the support of the division's sponsors.

2017 W. Müller Blow Molding Scholarship Awarded

Logan Tate has been awarded the SPE Blow Molding Division's 2017 W. Müller Blow Molding Scholarship in the amount of $3000. Logan was chosen for this award by the division's scholarship selection committee based on his outstanding record of academic and extracurricular achievements. W. Müller USA, Inc. has pledged to support this scholarship with an annual $3,000 contribution.

Logan is a rising senior studying Plastics and Polymer Engineering Technologies at Pennsylvania College of Technology in Williamsport, PA. Currently he is serving a consecutive term as the SPE Student Chapter President at Penn College, a club recognized for their excellence at ANTEC 2017.

During Summer 2017, Logan worked as a Plastics

Engineering Intern at B. Braun Medical's headquarters in Allentown, Pennsylvania. During his summer experience, he worked in both the extrusion and injection molding departments. In extrusion, Logan was working with medical and surgical tubing. Here he worked with high speed extrusion lines, co-extruded tubing, striped tubing, wire encapsulation, multi-lumen, bump tubing, and paratubing. He was also able to work closely with the engineers involved in installing new extrusion lines, assisted during operations qualifications, and produced samples for product qualifications. As for injection molding, Logan spent most of his time assisting the engineers with mold validations and conducting RCAs.

While in school, Logan has been working for the Plastics Innovation & Resource Center as a Research Assistant. Here he works with clients on a variety of projects including process optimization/validation, product/material development, and assist with Workforce Development & Training workshops.

Logan earned a B.S. in Physics from Lock Haven University in 2015 and is excited to combine it with a B.S. in Plastics and Polymers Engineering Technologies in May 2018. He is excited to start exploring full-time opportunities that will utilize his educational and professional experiences in the arena of plastics engineering. Tate has a passion for operational excellence and strives to be at the forefront of innovation.

The value of the division's scholarships is up to $3,000. The award recipients are recognized at the SPE Annual Blow Molding Conference (ABC). A travel allowance is provided.

Qualifications for the scholarship are as follows:
1. The student must be enrolled full-time in a degreed undergraduate plastics engineering program.
2. The student should be completing the second year of a four-year program.
3. The student will have at least a 2.5 overall grade point average (4.0 scale).
4. The student must be a member of a SPE Student Chapter.
5. The applicant will submit a brief essay with their application describing the importance of blow molding to the technical parts and packaging industry. ■

Need help with your technical school or college expenses?

If you or someone you know is working towards a career in the plastics industry, let the Blow Molding Division help support those education goals. So far, this Division has awarded more than $260,000 in scholarships for 40 deserving students while pursuing undergraduate degrees in the plastics program.

Here is a partial list of schools and colleges whose students have benefited from the Blow Molding Division Scholarship Program:

- Ferris State University
- Penn College of Technology
- Pittsburg State
- Penn State Erie
- Shawnee State University
- University of Massachusetts Lowell
- Western Washington University

Two scholarships worth $3,000 awarded annually to the deserving student(s).

Start by completing

the application forms at

www.blowmoldingdivision.com

or at www.4spe.org

SPE BLOW MOLDING DIVISION

Greetings

Scott Steele

The Fall Council meeting was also the 75th anniversary party for SPE. The meeting kicked off with an excellent reception Thursday put on by the Detroit Section and Plastics News. They recognized rising stars in the industry and many of them were able to attend. Some speakers from the revitalization efforts in Detroit also showed a community coming together and making progress. SPE also put on a nice program about what SPE is and does with a good forward looking message.

The council meeting itself was lower in attendance due to the impending Hurricane Harvey but there was a quorum. Financially the society is in the best cash position it has been in for 10 years mainly due to a strong deal we just concluded for the publishing of the journals. Revenue however continues to slide with membership.

The meeting was the first for our new Executive Director Patrick Farey who replaced Wim DeVos on June 20. Patrick reviewed his short-term objective which is to stabilize the society's profitability. SPE once again plan to spend on improvements to the website and technology. Patrick has tied in his objectives with the 3 year operating plan created by the incoming president Raed AlZubi. Copies of their presentation to council are available on the Chain section of the SPE Website.

Eve Vitale, the SPE Foundation Director, gave an update on the PlastiVan program. Many councilors agreed that the program has been re-energized by Eve and the new instructors. Our Division has not supported the program in recent years because we were not happy with the product. The new staff members have put the program back on track and hopefully you will see the PlastiVan again.

There is a renewed call for leadership talent to step up in the society. Much of the council is turning over. We are making a push to attract young professionals to the group. Our division should be looking to do the same thing as the average age of our board continues to increase.

At a minimum, we should nominate our young members for inclusion in the Plastics News Rising Stars list. If you know of anyone that you think fits that group, let me know and I'll champion their nomination. ■

SPE BLOW MOLDING DIVISION

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Upcoming Division Board Meeting

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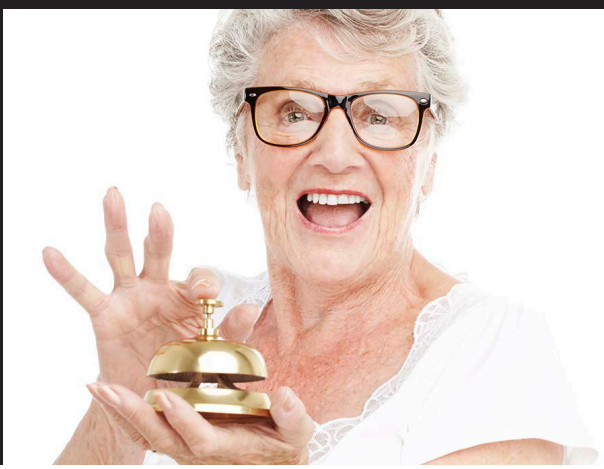
For more information, contact Deirdre Turner at (248) 505-5136 or deirdremturner@gmail.com

MISSION STATEMENT

Promote, communicate and disseminate knowledge relating to the art and science of blow molding technology.



Retirement Holiday

Recently I was checking my 401k account and thinking about retirement. Then I saw an article about nursing homes and retirement homes and the expenses.

Suddenly it hit me. No nursing home for me! Here is my plan:

I'm checking into the Holiday Inn.

With the average cost for a nursing home reaching $188 per day, there is a better way when we get old and feeble.

I have already checked on reservations at the Holiday Inn. For a combined long-term stay discount and senior discount, it's $49.23 per night. That leaves $138.77 a day for breakfast, lunch, dinner in any restaurant I want, or room service. It also leaves enough for laundry, gratuities, and special TV movies. Plus, I'll get a swimming pool, a workout room, a lounge, and washer and dryer. I'll also get free toothpaste, razors, shampoo and soap. And I'll be treated like a customer, not a patient.

Five dollars worth of tips a day will have the entire staff scrambling.

There is a city bus stop out front, and seniors ride free. The handicap bus will also pick me up if I fake a decent limp. Ride the church bus free on Sundays. For a change of scenery, take the airport shuttle bus and eat at one of the nice restaurants there. While you're at the airport, fly somewhere.

Meanwhile, the cash keeps building up.

It takes months to get into decent nursing homes. On the other hand, Holiday Inn will take your reservation today. And you are not stuck in one place forever -- you can move from Inn to Inn, or even from city to city.

Want to see Hawaii? They have a Holiday Inn there, too.

TV broken? Light bulbs need changing? Need a mattress replaced? No problem. They fix everything and apologize for the inconvenience.

The Inn has a night security person and daily room service. The maid checks if you are OK. If not, they will call the undertaker or an ambulance. If you fall and break a hip, Medicare will pay for the hip, and Holiday Inn will upgrade you to a suite for the rest of your life.

And no worries about visits from the family. They will always be glad to visit you, and probably check in for a mini-vacation. The grandkids can use the pool. What more can you ask for?

When I discussed my plan with friends, they came up with even more benefits that Holiday Inn provides retirees. Most standard rooms have coffee makers, reclining chairs, and satellite TV -- all you need to enjoy a cozy afternoon. After a movie and a good nap, you can check on your children (free local phone calls), then take a stroll to the lounge or restaurant where you meet new and exotic people every day.

Many Holiday Inns even feature live entertainment on the weekends. Often they have special offers, too, like the Kids Eat Free program. You can invite your grandkids over after school to have a free dinner with you. Just tell them not to bring more than three friends.

Pick a Holiday Inn where they allow pets, and your best friend can keep you company as well.

If you want to travel, but are a bit skittish about unfamiliar surroundings, you'll always feel at home because wherever you go, the rooms all look the same. And if you're getting a little absent-minded in your old days, you never have to worry about not finding your room -- your electronic key fits only one door and the helpful bellman or desk clerk is on duty 24/7.

Being natural skeptics, we called a Holiday Inn to check out the feasibility of my plan. I'm happy to report that they were positively giddy at the idea of us checking in for a year or more. They even offered to negotiate the rate. We could have easily knocked them down to $40 a night!

So, when I reach the golden age I'll face it with a grin. ■

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