



# Thermoforming

## Quarterly®

A JOURNAL OF THE THERMOFORMING DIVISION OF THE SOCIETY OF PLASTIC ENGINEERS

FIRST QUARTER 2013 ■ VOLUME 32 ■ NUMBER 1

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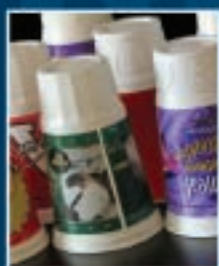
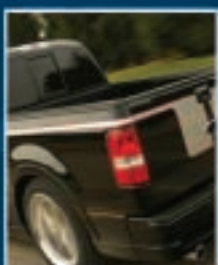
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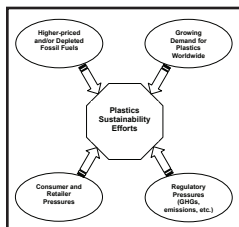
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# Thermoforming Division Continues to Thrive

**W**ith a very successful Grand Rapids conference under our belt, I'm looking forward to the many exciting opportunities that 2013 has in store for us. I am very happy to report that our Division was able to present a check for \$63,266 to SPE headquarters, their share of the proceeds from our annual conference.

We all know that understanding operational costs in business is critical in today's competitive landscape. A good friend of mine always told me that a company makes its money on the production floor. Identifying and managing those costs is not always an easy task. In this issue, Douglas Hicks writes about this issue with candor in, "Shortcomings and Dangers of Direct Labor-Based Costing." Hicks outlines the many problems

inherent in this type of costing method. He explains how the continued use of direct labor-based cost models greatly diminishes the quality of a manufacturer's decision-making process and ultimately produces adverse effects to the bottom line.

On page 12, Susan Spencer's article addresses a problem that many thermoforming companies will recognize. Employee attrition can strain a business if skilled candidates are not available to replace retired employees. Mayfield Plastics of Sutton, MA is working with a regional organization, the Blackstone Valley Education Foundation, to address these problems. The foundation is a nonprofit organization that helps schools prepare students for the workforce. This magazine and this division continue to push for greater emphasis on workforce development.

Lastly, I do have to report that after 14 years of service to the Thermoforming Division, I'm retiring from the Board and stepping down as Chairman. Starting at this year's May meeting, Mark Strachan will be assuming the Chairmanship responsibilities for the Thermoforming Board of Directors. It has been a pleasure to be a part of this family. I ask that you please continue to support Mark and the Board as they work to promote all aspects of thermoforming, as they have been doing for over 37 years.

As always, we would like to hear your ideas, comments and feedback. Together we will continue to advance our industry through inspiration, ideas and innovation. |

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## Floe Resurrecting Giant Thermoforming Machine

By Michael Lauzon, Correspondent Published: December 28, 2012 6:00 am ET  
Updated: December 28, 2012 3:00 pm ET MCGREGOR, MINNESOTA



A large-machine thermoforming operation is due to start operating in February.

Floe International Inc. is building a 400,000-square-foot facility in McGregor that will house what consultants said is the largest rotary thermoformer in the world, a 10-foot-by-25-foot behemoth that has been sitting idle for several years.

"We will have several proprietary products in transportation and will try to provide solutions for large products," said Floe International CEO Wayne Floe in a telephone interview.

Wayne Floe did not specify the cost of the project, only saying it will involve millions of dollars.

He has an extensive background in marine products, many of which could be made by the large thermoforming machine. Watercraft, floating docks and trailers are some of the items the new operation could make.

He said he has been dealing with contract thermoformers to make marine-related products at the firm's headquarters in McGregor and in Hoyt Lake, MN. For components not large enough to justify the large machine, Floe International will continue to rely on outside thermoformers, he said.

Wayne Floe said he has been in the marine products business for 30 years and the decision to invest in the large machine was made after he gave it a lot of thought.

"It means we can take our technologies to a new level," he said. "We've been studying what to do since the 1990s."

Floe International expects to buy high density polyethylene, ABS and capped ABS sheet to feed the machine, which has a 6-foot draw and can make parts weighing as much as 600 pounds.

Two consultants working with Floe International said the machine has been the largest in the world since it was built in 2004 by now-defunct Advanced Ventures in Technology Inc. of Gladwin, MI.

Roger Fox of manufacturer's representative Foxmor Group Inc. of Wheaton, IL, and consultant Robert Browning of Isosceles Inc. of Atlanta, GA helped advise on the project.

The machine originally was built for Better Bath Components of Waxahachie, TX, to make components for recreational vehicles, manufactured housing and marine products, but the applications did not pan out as expected.

After Advanced Ventures in Technology went out of business, many of its employees started another machinery company, American Thermoforming Machinery LLC of West Branch, MI. |

## PET Thermoformer MicroGreen Plans to Expand

By Jessica Holbrook, Staff Reporter  
Published: January 17, 2013 2:04 pm ET  
Updated: January 17, 2013 2:09 pm ET  
ARLINGTON, WASHINGTON

MicroGreen Polymers Inc. plans to expand its production capacity, a project jump started by a \$5 million investment from the Stillaguamish Tribe of Indians.

MicroGreen is looking to raise \$20 million in this round of funding. The funds will go toward purchasing new equipment and tooling, and will take the company from producing on a small, testing-scale to producing at commercial capacity, said Chris Jacobs, vice president of marketing and product development, in a phone interview.

MicroGreen uses patented technology, named Ad-air, to add microbubbles to solid sheets of recycled PET. According to MicroGreen, the company uses its expanded PET to thermoform cups and trays that are lightweight and require less material to produce, contain up to 50 percent post-consumer content and are insulated and temperature resistant.

MicroGreen plans to add several new production lines and invest in tooling to expand its line of cups and trays.

The company currently operates one thermoforming line – an R&D line – that can produce a few hundred-million pieces a year.

"In the food service world, that's not much," Jacobs said.

"There's so much opportunity out there," he said. "Even if we only aim for the low-hanging fruit, we'll need 20 to 30 production lines."

The company will also purchase an extruder. Right now, MicroGreen buys sheets of PET with up to 50 percent recycled content. Extruding in-house will allow the company to raise the amount of recycled content, Jacobs said.

With the increased production capacity, MicroGreen needs more employees. The company currently employs 45, but plans to employ 200-300 by year end, Jacobs said. MicroGreen operates one facility in Arlington, Wash. The company has room to expand at its current site, but increasing the size of its current plant or opening a new one will depend on customer's needs and requirements, he added.

The company is still working on meeting its \$20 million mark. MicroGreen is in talk with venture capitalist investors, but the Stillaguamish Tribe also is helping out.

Koran Andrews, the Stillaguamish Tribe's enterprise corporation CEO, and other tribal members toured MicroGreen's facility last year. The Tribe purchased cups for its Angel of the Winds Casino in Arlington, and were so impressed with MicroGreen's process and mission that they asked about becoming investors, Jacobs said.

"That's how they got turned on to it, knowing that our focus was about showing people that being successful in business and doing the right thing environmentally, and for the world, is not mutually exclusive," he said.

The Stillaguamish Tribe was also looking to diversify its investment portfolio. The Tribe is now working to put together a consortium with other Native American tribes that have the same goal to invest in MicroGreen.

The Stillaguamish Tribe's initial investment was enough to get MicroGreen started, and the company plans to move forward with just the \$5 million secured.

The company plans to close this round of funding by the end of the first quarter, when it closes they'll know "how steep the on-ramp really is," Jacobs said. |

## 2013 EDITORIAL CALENDAR

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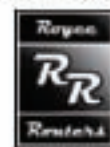
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# The Dangers of Direct Labor-Based Costing in Manufacturing

By Douglas T. Hicks, CPA

**A**s we begin the second decade of the 21st Century – over a quarter century into the “cost measurement and management revolution” – most U.S. manufacturers, including those in the plastics industry, continue to base not only their day-to-day cost accounting systems, but the cost information they use to support critical management decisions, on cost models driven primarily by direct labor. These cost models, developed at a time when product and process variety were minimal and direct labor was a major cost of manufacturing, are simple, easy to use and explain, compatible with most ERP and other manufacturing software and, in a vast majority of cases, totally inappropriate.

The introduction of high-tech and computer-controller manufacturing processes, the ever increasing demand for complexity and variety in manufactured products, the adoption of lean manufacturing philosophies, and the expansion of pre-manufacturing and post-manufacturing services – including distribution and fulfillment – have pushed the realities of 21st Century manufacturing far beyond the capabilities of “simple and easy to use.” As costing pioneer Alexander Hamilton Church stated over 100 years ago, “No facts that are in themselves complex can be represented in fewer elements than they naturally possess ... there is a minimum of possible simplicity that cannot be further reduced without destroying the value of the whole fabric.”

In the 21st Century, direct labor-based costing has fallen far below the “minimum of possible simplicity.” It no longer provides a valid model of the economics that underlie a modern manufacturing organization and, as a consequence, should no longer be relied upon as a method of measuring a manufacturer’s product, process, or customer costs – especially when these costs are used to support critical management decisions.

## What’s Wrong With Direct Labor-Based Cost Models?

In its simplest form, a manufacturer will use a single, plant-wide overhead rate – expressed as either a percentage of

direct labor cost or an overhead cost per direct labor hour – to be added to direct labor’s hourly cost. All non-manufacturing costs will then be assigned to cost objectives (products, customers, etc.) as an add-on percentage (known commonly as an “SG&A rate”). The irrationality of such a cost model should be apparent to anyone who gives it a second thought.

Is the cost of an individual manually assembling or visually inspecting a part the same as one who operates a high-tech machine center that devours power and expensive perishable tooling? If a worker can operate two machines at the same time does each machine only cost one-half as much as when a worker can only operate one machine at a time? Is the cost of heat treating or plating determined by the amount of time it takes for workers to load and unload parts? A direct labor-based cost model with a single, plant-wide overhead rate suggests that the answer to each of these questions is “YES” – an answer that totally defies logic.

Many accountants believe that if they segregate manufacturing into multiple cost centers and then develop separate direct labor-based overhead rates for each cost center, the problem will be averted. That is, unfortunately, not the case. A company using multiple direct labor-based overhead rates to apply indirect manufacturing costs and a traditional, company-wide, total-cost based “SG&A” rate to assign non-manufacturing costs to products and customers will continue to experience shortcomings such as:

- *The cost of cells and lines will be misstated and, as a consequence, any products manufactured using these cells and lines will be costed inaccurately.* Cells and lines require a fixed amount of cost to operate regardless of how many workers are present. Occupancy and capital equipment costs are primary examples. The variable costs of operating cells and lines (utilities, perishable tooling and other consumables) are generally driven by the operation of the equipment, not the activity of a worker. Linking such fixed and variable costs to the hours worked by

cell/line workers makes it appear as if these costs vary in direct proportion to those hours. A smaller crew attending the line implies that these costs are reduced when in reality they stay the same. A larger crew will imply that these costs increase when, in fact, they remain the same. The ramifications of this error are many; from industrial engineers miscalculating the impact of direct labor savings to losing profitable products due to overpricing or winning unprofitable jobs due to underpricing.

- *CNC equipment and any other equipment that requires only a partial direct worker, or perhaps no worker at all, will be costed incorrectly.* If a worker attends two machines, each machine's operation will still appear to cost only one-half as much as it does when the worker attends a single machine. Obviously, this does not reflect reality. The equipment cost does not vary with the hours of direct labor; it varies with the equipment's hours of operation. The impact on pricing decisions should be readily apparent. The misstated savings from labor reductions or the impact of adding workers to improve equipment throughput time will also mislead management.
- *Any equipment whose attending crew size can vary based on the characteristics of the product being produced will be costed incorrectly.* As in the case of fractional workers, the equipment does not cost twice as much to operate simply because it requires two workers instead of one nor does it cost one-half as much when one worker is required as opposed to two. The pricing and cost savings implications are the same as with CNC equipment.
- *The price paid for purchased materials, components and outside manufacturing services will appear to be the total cost of those items.* The cost of purchasing, handling, quality, storing, financing, and other administrative activities required to support purchased (or customer provided) materials, components and outside manufacturing services will be buried in manufacturing overhead or SG&A costs. The minimal support cost for off-the-shelf items will go unnoticed as will the much higher support cost of custom items. Slow-turning items will not be penalized for the extra space and financing they require while the benefits of fast-turning items will be invisible. No cost will be assigned to customer-provided or consigned items even though they require support from many of the same activities as

the company's purchased items. The major costs needed to support outside manufacturing services, including the extra inventory-related costs when items are sent outside in the midst of the manufacturing process, will be ignored. The cost benefits of high-volume items purchased in bulk and handled using mechanized systems will be lost while the extra cost required to support low-volume items requiring substantial handling and storage will be ignored. Perhaps most dramatic will be the total absence of support costs related to the purchase of items from overseas. Offshoring decisions will be made in total ignorance of the economics that underlie such a critical decision.

- *Post-manufacturing costs, like those related to finished goods storage, order picking, order processing, shipment preparation and logistics, will be invisible.* Because the cost of these activities lay buried in manufacturing overhead or the company's SG&A rate, it is impossible to assign them to the customers that require them, thereby making accurate measures of customer profitability impossible. Instead, these costs will remain buried in manufacturing overhead or SG&A and be spread like peanut butter to all customers in proportion to their product costs.

These are just a few of the common shortcomings inherent in direct labor-based costing at manufacturing firms. There are many others. Each manufacturer will have its own unique set of issues. Nevertheless, even with "band aids" applied to a direct labor-based cost model, the high-quality product, customer, and process cost information necessary for a manufacturer to make sound decisions and take effective actions will be non-existent. Instead, cost information will remain inaccurate and misleading.

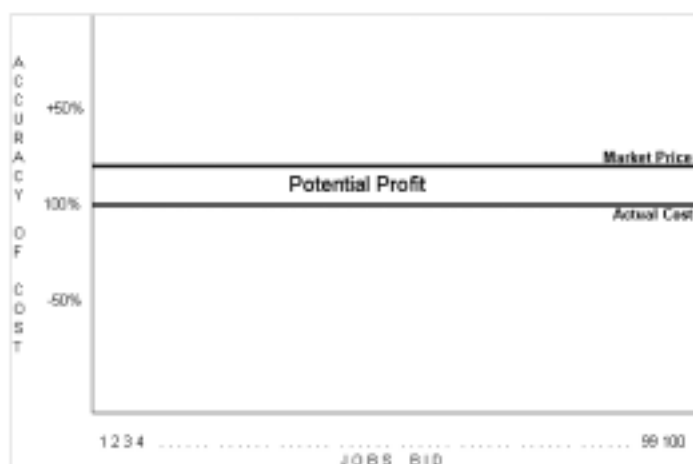
### **What Difference Does it Really Make?**

If the negative impact the distortions inherent in direct labor-based costing have on a manufacturer's decision making are not obvious, understanding the effect they have on pricing decisions should help make the connection crystal clear. There is a law of economics – known at my firm as *Hicks' First Law of Pricing* – that applies here. That law goes like this: "A company will get a lot of business when it does not charge its customers for things it does for them, but it will not get much business when it attempts to charge its customers for things that it doesn't do for them."

*(continued on next page)*

For example, one manufacturer has overall productivity that is about average for its industry and marketplace. Under normal economic conditions, the market will allow this company, whose costs are at the industry average, to charge a price that will enable it to recapture its cost and earn enough of a profit to ensure its continuing ability to supply the marketplace. If this company accurately calculates its “fully-absorbed” costs and adds a market-supportable profit margin on each of one hundred possible contracts, it should be competitive on those contracts and will earn its expected profit margin on any contract it is awarded.

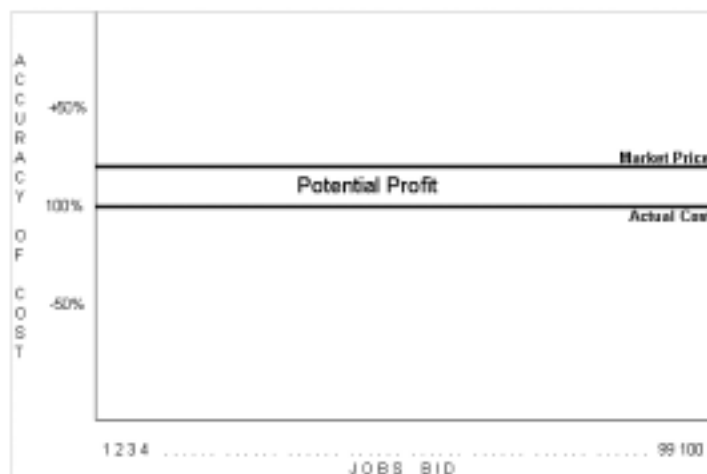
This situation is shown graphically in Figure 1 in which the horizontal axis represents one hundred contracts bid and the vertical axis the percentage accuracy of its fully-absorbed cost estimates. The market prices shown provide consistent margins above the accurately determined costs. The area between the market price and the 100% accurate contract costs represents the profit on any contract awarded at the market price.



**Figure 1 – Market Price/Profit Potential.**

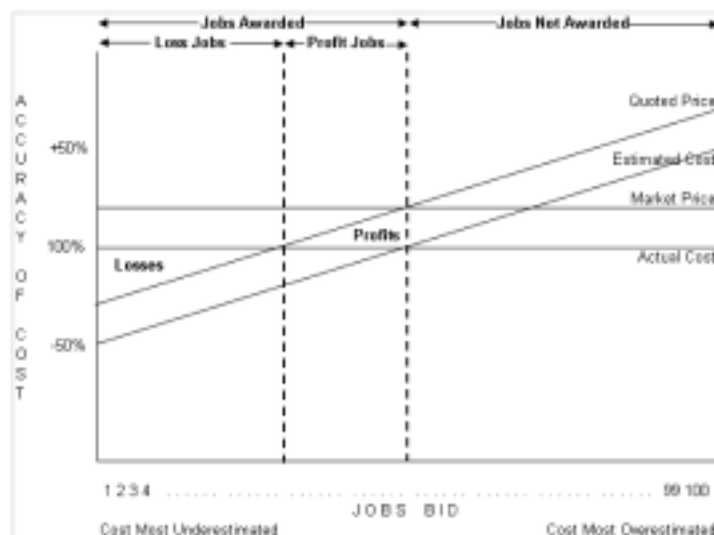
If this company uses an inappropriate, over-generalized methodology (such as applying overhead costs on the basis of direct labor hours/dollars) to estimate its costs, it will overestimate the fully-absorbed cost on approximately one half of the contracts bid and underestimate the costs on the other half. As a result, it will establish an *acceptable price* (quoted price) at levels that will be under the market for those contracts whose costs were underestimated and over the market for those contracts whose cost were overestimated. This situation can be seen graphically in Figure 2 in which contracts are sequenced from left to right starting with the contract whose cost was most underestimated and ending with the contract whose cost was most overestimated.

Looking at the “Quoted Price” and “Market Price” lines, it is obvious that the company will be much more likely to be



**Figure 2 – Pricing Based on Over-Generalized Costs.**

awarded contracts on the left side of the diagram – contracts bid at less than market price – for which it was “*not charging the customer for things it does for them.*” Conversely, it will not be awarded contracts on the right side of the diagram – contracts that could have been profitable at much lower prices – for which it was “*charging the customer for things it does not do for them.*” Unfortunately, actual costs do not care whether they have been over or underestimated; they will be *actual* either way. As Figure 3 clearly shows, if the company is awarded those contracts that were inadvertently priced below market, it has little or no chance of financial success. At the same time it will be missing out on the potential profits that could have been earned at the market price on those contracts its inaccurate costing methodologies caused it to overprice.



**Figure 3 – Profitability Analysis of Contracts Won.**

Pricing is not the only area where distortions and problems lead to low-quality decisions. The savings from operating improvements are regularly miscalculated. One company added new controls to a piece of equipment that made it possible to reduce the number of workers needed to operate

the machine from two to one. The anticipated cost reduction not only included the cost of one laborer, but it was estimated that the equipment's variable operating costs – including perishable tooling and utilities – would also cut in half. The latter was not a savings they were likely to realize.

Another major area where direct labor-based costing impacts a manufacturer's decision making adversely is in insourcing and outsourcing decisions, particularly those related to offshoring. Chasing the lowest "price" for a purchased item does not always insure that the lowest "cost" will be obtained. I know of one company that saved \$3 million annually in component prices by moving the manufacture of a group of parts to China. The only catch was that they spent \$3.5 million annually – all of which was buried in its manufacturing overhead and SG&A costs – to achieve this savings. It's no wonder this company was out of business less than two years later.

The inability to link customer-related costs to the customers that require them also leads to poor pricing decisions and inaccurate measures of customer profitability. Consider the case of a manufacturer who sells the same product to two different customers at the same price. They produce 10,000 units in a single batch each week. 5,000 units are immediately shipped to one of the customers. The remaining 5,000 units are moved to finished goods inventory with 1,000 units being shipped to the customer each day. Do you suppose each of these customers generates the same amount of profit for the manufacturer? The company's direct labor-based costing model makes them appear equal in profitability.

### **Decision Cost Information ≠ Cost Accounting Information**

One of the great philosophical mistakes in cost measurement and management is the belief that cost information for decision making must come from a company's cost accounting system. The purpose of cost information is insight; insights that will improve a company's decision making processes and enhance its bottom line. Cost accounting systems are designed to value the company's overall inventory and calculate its overall cost of goods sold for use in company-wide financial statements – not to determine the cost of the individual elements that comprise the company's operation. As a consequence, cost accounting systems incorporate too many generalities and shortcuts to provide accurate and actionable cost information.

A manufacturer does not need a great cost accounting system to have high-quality cost information to support its decisions. It needs a valid economic cost model of its

business. Fortunately, the creation of a valid cost model that provides accurate, actionable cost information requires only a fraction of the resources needed to implement a new cost accounting system. A fundamentally sound ERP or other manufacturing information system is still important – it provides much of the data necessary to populate the cost model – but it's the model that generates accurate, relevant and actionable cost information, not the system. Many manufacturers have created and used valid cost models to enhance their bottom lines without changing their day-to-day cost accounting systems.

### **Conclusion**

A 21st Century manufacturing firm that uses a direct labor-based cost model to determine costs for use in supporting decisions is putting itself at considerable risk. Direct labor may have been an appropriate basis for developing cost information when competition was less, products were uniform, customers demanded few, if any, extra services and direct labor was the major factor in manufacturing. None of that is true today. Today's manufacturing environment requires high-quality cost information – information based on a valid economic cost model of the business – if the manufacturer is to thrive and grow in the future.

### **About the Author**

#### **DOUGLAS T. HICKS, CPA**

During his 27 years as an author, speaker and consultant, Doug Hicks has championed the development of practical, down-to-earth cost management solutions for small and mid-sized organizations. In that time, he has helped over 200 organizations of all types and sizes transform their history-oriented accounting data into customized, value-enhancing decision support information that provides their decision makers with the accurate and relevant intelligence they need to thrive and grow in a competitive world. He has shared his experience through hundreds of seminars and conferences, articles that have been published in dozens of trade and professional periodicals and three books that have sold over 15,000 copies worldwide.

He is a member of the Institute of Management Accountants, the Society of Cost Management, and the Michigan Association of CPAs. |

# Grant to Help Students See Manufacturing As Opportunity

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By Susan Spencer, Telegram & Gazette Staff  
susan.spencer@telegram.com  
SUTTON, MASSACHUSETTS*

**H**arrison Greene, vice president of growth and development at Mayfield Plastics in Sutton, is scared. It's not that the custom thermoforming manufacturer's business is down – in fact, it's held strong through the recession and its workforce of 48 employees has grown 5 percent since last year.

But as Mr. Greene looks ahead three or four years, he sees a number of his company's aging staff members retiring and no one coming up the pipeline to replace them.

It doesn't require a college degree to make the custom plastic parts Mayfield sells to the medical, aerospace, transportation and electronics industries. Skill training is required, though, for the detailed work with the computers that control manufacturing processes.

Mr. Greene said today's high school students and their parents have outdated views of manufacturing and shy away from what is a solid and growing sector of the economy.

He is one of a handful of local manufacturers working with the Blackstone Valley Education Foundation on a recent grant from MassDevelopment, through the Central Massachusetts Workforce Investment Board.

The "AMP It Up!" grant will introduce science, technology, engineering and math teachers for Grades 7-12 in 10 Blackstone Valley districts to career options in advanced manufacturing. The goal is to bolster the prospective employee base for these skilled jobs by raising awareness among adults who influence teens' lives.



*(Left to right:) Paul Lynskey, Executive Director of Blackstone Valley Education Foundation, and Harrison Greene of Mayfield Plastics. (T&G Staff/CHRISTINE PETERSON)*

The foundation is a nonprofit organization that aims to help schools prepare students for the future workforce.

According to Paul Lynskey, executive director of the Blackstone Valley Education Foundation, the \$10,000 grant will include visits to manufacturers by middle and high school teachers and counselors; a local conference to hear from business leaders about employment opportunities in manufacturing and required skills; weeklong summer externships with stipends for teachers and counselors at local manufacturers; and outreach at participating schools to provide information to other faculty, students and families about manufacturing careers.

Mr. Greene said Mayfield Plastics recruits employees through referrals from current workers or classified ads. But it's hard to get young workers.

"Mom and Dad typically think that manufacturing is working in some grease pit some where," he said.

“They think if you don’t go to school and get a bachelor’s degree, you’re nothing. That’s a myth. A degree is not a career.”

Mr. Lynskey said 70 to 80 percent of graduating high school students go on to college. He wants to reach the roughly 30 percent who don’t. Their main options, he said, include retail, service jobs or manufacturing.

“That’s where my competition is. It’s not convincing parents they’re not sending their kid to college,” he said. “The connection we need to make is with the local manufacturers and businesses and define the skills they need.”

Entry-level pay in manufacturing is typically higher than in retail and service sectors, starting at \$14 to \$18 per hour and moving up to \$22 to \$25 per hour. A highly skilled position like tool designer pays upward of \$50,000 or more, Mr. Greene said. His company also provides health and retirement benefits.

Genie Stack, director of guidance at Douglas High School, said, “I think students don’t know what careers in manufacturing are. There needs to be more education in the types of jobs there.”

Douglas High School offers science technology, drafting and manufacturing classes in which students learn about drawing and computer-aided design, but the courses don’t go very far.

Mrs. Stack said, “The jobs are there, the kids are here, and there’s a disconnect.” Jeffrey T. Turgeon, executive director of the Central Massachusetts Workforce Investment Board, which oversees the grant regionally, said, “We’re helping bridge that gap between education and careers. Teachers will bring hands-on experiences and the changing nature of manufacturing ... to the classroom.”

Mr. Turgeon said that, according to a recent study by the Federal Reserve Bank of Boston, manufacturing is the third-largest employment sector in Central Massachusetts, with more than 11 percent of the workforce. Statewide, 8 percent of the workforce is in manufacturing.

“Manufacturing is an important industry in Massachusetts and particularly in regions of the state that are outside of Boston,” said Nancy L. Snyder, president of Commonwealth Corporation, a quasi-public workforce development organization. “It’s an industry that’s doing a lot of hiring right now.”

Ms. Snyder attributed the industry’s workforce demand to the need to replace retiring workers and a shift to “re-shoring,” a reversal of the off-shoring trend of the past decade. She said businesses are returning to the local labor market because wages in China, where many jobs went, are no longer much lower than in the United States. Add in shipping and energy expenses, and off-shoring doesn’t have such a cost advantage.

Also, she said, firms want to make sure there’s a lot of quality assurance going into the manufactured parts they purchase, which has returned their interest in domestic manufacturers.

Mr. Greene said, “This business is all about quality.”

Not only do his customers demand quality production, but they also want on-time delivery and outstanding customer service.

“Businesses and industries that buy from us are buying American,” Mr. Greene said. “The threat is they won’t be able to continue to buy American because we can’t find skilled labor.”

Ms. Snyder said manufacturing is a good career path for smart students who are not heading to college, who like computers and like to work with their hands.

“The industry itself is very different from the one people picture in their minds,” she said. “It’s very clean, it’s high-tech, and it’s focused on teamwork.”

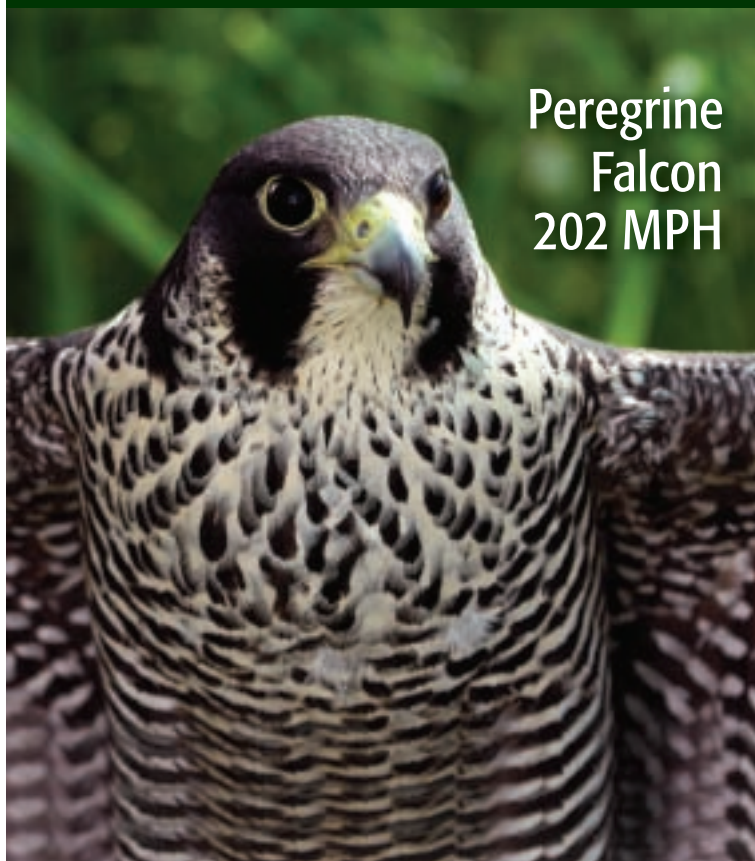
Ms. Snyder said: “It’s a highly skilled industry, but not one where you need a lot of education based in the classroom. It tends to be hands-on.”

And unlike the old Lucille Ball television comedy in which assembly line workers wrapped pieces of candy on a relentless conveyor belt, modern manufacturing involves diverse technical skills.

“You’re doing a lot of critical thinking and problem-solving on the job,” Ms. Snyder said. Mr. Greene said high schools and colleges need to move away from focusing largely on “preparing the elite for a classical education.”

He added, “The whole educational system needs to be revamped to provide meaningful education.” |

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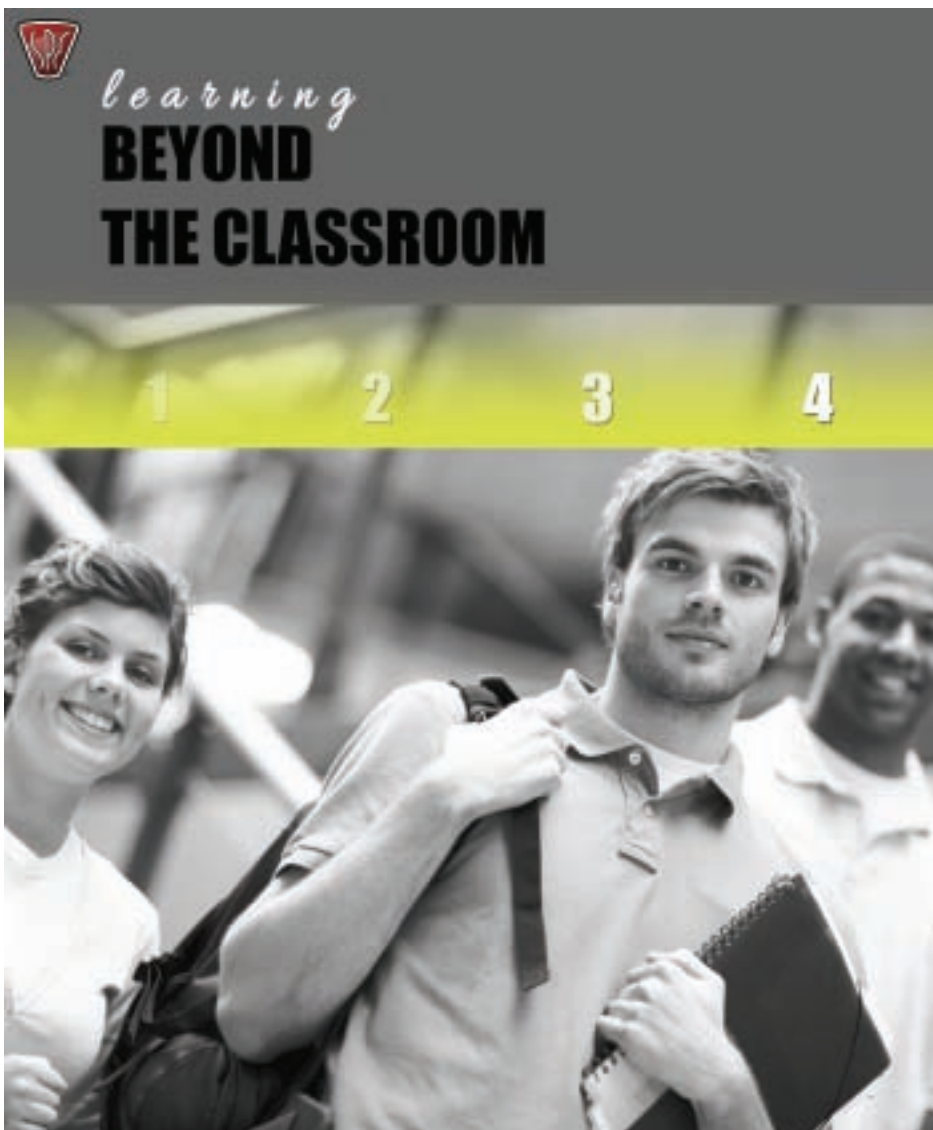
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If you are an educator, student or advisor in a college or university with a plastics program, we want to hear from you! The SPE Thermoforming Division has a long and rich tradition of working with academic partners. From scholarships and grants to workforce development programs, the division seeks to promote a stronger bond between industry and academia.

**Thermoforming Quarterly** is proud to publish news and stories related to the science and business of thermoforming:

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We are also interested in hearing from our members and colleagues around the world. If your school or institution has an international partner, please invite them to submit relevant content. We publish press releases, student essays, photos and technical papers. If you would like to arrange an interview, please contact Brian Winton, Academic Programs, at:

[bwinton@lyleindustries.com](mailto:bwinton@lyleindustries.com) or 989.435.7718, ext. 32



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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  
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[cpcarlin@gmail.com](mailto:cpcarlin@gmail.com)



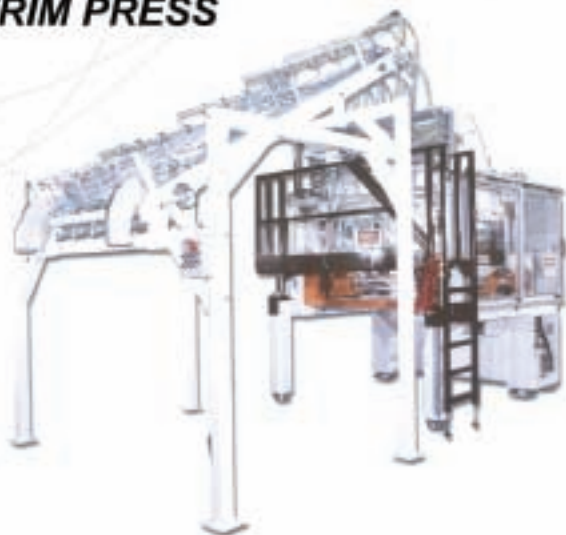
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## SPE Thermoforming Conference® Parts Competition Guidelines

September 9-12  
Atlanta, Georgia

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| <b>Submission Deadline:</b>            | <b>August 19, 2013</b>   |
| <b>Shipments May Arrive Beginning:</b> | <b>August 2, 2013</b>    |
| <b>Shipment Deadline:</b>              | <b>September 2, 2013</b> |

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1. All submissions must be final thermoformed components produced from production tooling.
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3. All images and descriptions must be emailed to the Parts Competition Chair two (2) weeks prior to the Conference. Images must be in JPEG format and not exceed 1MB.
4. The judging committee reserves the right to re-categorize a product submission and to merge categories that do not have at least five (5) entries.
5. Awards will be presented at the Thermoformer of the Year Dinner on Tuesday, September 10, at the Renaissance Atlanta Waverly Hotel.

### Eligible Product Categories:

#### Roll-Fed

- ☐ Industrial
- ☐ Medical
- ☐ Food

#### Heavy Gauge

- ☐ Vacuum Form
- ☐ Pressure Form
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Commercial products must be produced from production tools.



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#### Contact:

Jim Arnet  
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**APPLICATION:**

This is for a real potential application. This tray system is to be used for cooling items such as sunglasses, candy bars, mobile phones, etc. inside a hot car by the use of the A/C vents.

|  |                          |
|--|--------------------------|
| <b>Intent to Present Deadline:</b>     | <b>April 15, 2013</b>    |
| <b>Submission Deadline:</b>            | <b>August 19, 2013</b>   |
| <b>Shipments May Arrive Beginning:</b> | <b>August 2, 2013</b>    |
| <b>Shipment Deadline:</b>              | <b>September 2, 2013</b> |

**CONCEPT:**

To create a thermoformed tray that can be mounted to a standard A/C vent in a car. The tray must be able to support as a minimum the weight of a cell phone. The tray must also be able to withstand the temperature changes inside a vehicle within the range of 0-140 degrees. The tray will need to have a quick mounting system for easy attachment and detachment to a standard a/c vent and allow for airflow to pass from both the top and bottom of the tray.

**MATERIALS:**

The choice of material is yours. The tray must be thermoformed. The attachment mechanism is left up to your own creativity. The material must be strong enough to support the weight and handle the temperature changes inside the car.

**TRAY PARAMETERS:** Not less than 2.75" wide or less than 6" in length nor more than 1" in depth.

**JUDGING:** All judging shall be based upon the parameters listed above. Creativity in design, mounting, venting, use of materials, and a unit part cost analysis shall be considered. First prize (\$1,000) and second prize (\$500) will be awarded.

**INTENT TO PRESENT:** If you wish to participate in the Student Parts Competition, please send an email to Jim Arnet on or before April 15, 2013.



|                 |   |
|-----------------|---|
| <b>Contact:</b> | <b>Jim Arnet</b>  |
|                 | 2013 Parts Competition Chair                              |
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### Strengthening the Message of Sustainable Plastics Packaging

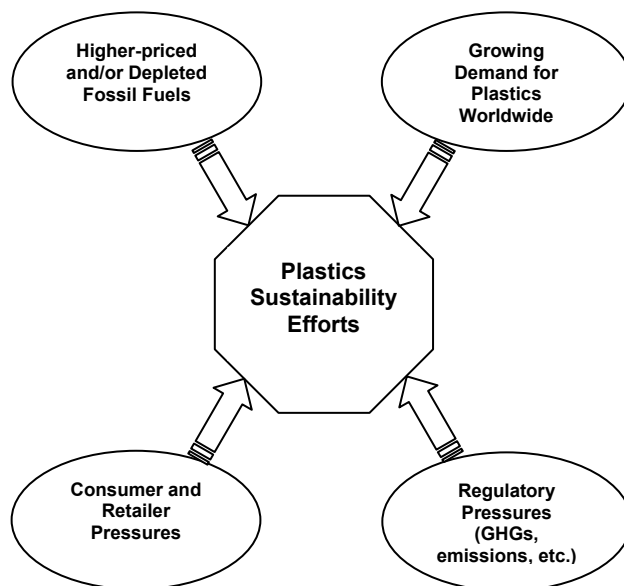
By Mike Tolinski, MText Technical Editing,  
Plymouth, MI 48170

#### Abstract

Recyclable, recycled-content, or bio-based plastics packaging will require more than just the right technologies and materials for sustained growth. Sustainable packaging acceptance and use will also require increasing the number of informed, enthusiastic retailers and packaging consumers interested in being “greener.” In short, their positive *attitudes* must be turned into buying and recycling *behaviors*. This paper focuses on one way in which packaging producers are drawing consumers’ attention to the recycled-content, recyclability, or bio-basis of new plastic packaging. Simple messages on the packaging itself not only can clarify green claims about the packaging, but can also serve as calls for consumer action. This paper considers the effectiveness of various messages and, referencing the U.S. Federal “Green Guides,” considers the ways in which a clear, honest sustainability claim can be communicated to both informed and skeptical audiences.

#### Introduction

A variety of forces are pressuring the plastics industry towards using materials and processes that make more sustainable use of natural resources or reduce waste (see Figure 1). Along with obvious influences related to feedstock and resin prices, growing worldwide plastics demand, and regulatory pressures, the plastics packaging sector in particular faces continuing pressure from large retailers such as Wal-Mart, and from more informed consumers who value sustainability. Some consumer-products providers have major sustainability goals; Procter & Gamble, for example, reportedly intends to replace “at least 25% of its petroleum-based materials with renewably sourced alternatives,” such as bio-based plastics [1]. And this green trend is strong across multiple industries. The number of “eco-friendly” product launches reportedly increased by 500% from 2007 to 2009 [2]. Packaging plastics, given their disposable, single-use nature, are perhaps the most obvious product types discussed in debates about sustainability. To market their products effectively, producers of sustainable plastics packaging need to play an active role in this debate, not just through communications with their food and consumer-product industry customers, but also with retailers and even the consumer.



**Figure 1. Large-scale social and natural forces pressuring efforts for making plastic packaging and products more sustainable and environmentally friendly {3}.**

This growing consumer and retailer awareness parallels recent regulatory developments. Some of these developments may have caught certain sectors of the plastics packaging industry off-guard. For example, bans on plastic film shopping bags are being initiated in coastal communities in the USA and in large regions in Europe and elsewhere, leaving bag suppliers scrambling to make the public aware of the recycling potential of bags and to strengthen bag-recycling programs.

Meanwhile, regulations are being enacted limiting the availability of certain plastic products that contain BPA or phthalate plasticizers, or products made from expanded polystyrene. For many consumers, these issues have the potential to influence buying behaviors, given steady exposure to media reports about ocean litter and “toxic plastics” (for example, [4]). In responding to these developments, the plastic industry has been forced mostly to take a defensive posture. But it’s fair to say that many concerned consumers and retailers are not comforted by the complex studies the industry has cited to show that their concerns are overblown, in its defense of traditional plastic materials.

Taking the offensive, the plastics industry has turned to recycling and alternative plastic chemistries as potential technological fixes for sustainability issues. Many of the industry's direct customers have welcomed the changes. But marketing these materials thoroughly requires clear, simple, and direct messaging for informing the consumer/retailer about the sustainable features of the newest plastics packaging.

Several factors complicate the way a "green" plastics package can communicate its recyclability, recycled-content, bio-based or renewable content, or biodegradability. The potential misuse of these terms for marketing purposes was recognized long ago. For this reason the U.S. Federal Trade Commission (FTC) established marketing guidelines now known commonly as the Green Guides. The Guides were revised in 1998 [5] and recently recast in 2010 with proposed revisions [6,7], based on information from an FTC consumer survey in 2009 [8] and a public comment period in 2010 [6]. These guidelines are at least a good starting point for packaging manufacturers and packaged-goods producers who are trying to determine how to create a marketing message that is brief, clear, and honest, drawing the attention of consumers and satisfying retailers who wish to sell greener product packaging.

Clarity is key, given that consumers (and many retailers) are confused by the terms used by industry to describe a material's sustainable qualities [6, §260.15]. For example, it has been found that most consumers do not understand that bio-based materials are not always biodegradable, or that biodegradability is typically a slow process that typically requires certain conditions, such as industrial composting [9]. Their confusion will continue unless the messaging on the product clearly explains the beneficial qualities of the sustainable packaging material. Marketing messages for consumers must not only account for this confusion, but also for emotional, value-driven reactions related to green issues. This is somewhat different than with the types of communications used in industrial marketing situations, where a buyer of resin or packaging products is likely to be more informed and rational in buying situations (see Table 1).

**Table 1. Basic differences between audiences in consumer-focused marketing and in industrial marketing situations (table derived partly from [10]).**

| Consumer Audience               | Industrial Audience                  |
|---------------------------------|--------------------------------------|
| Emotional, impulsive            | Rational, deliberative               |
| Influenced by advertising       | Influenced by costs and ROI          |
| Qualitative                     | Quantitative                         |
| Self-actualizing                | Company-focused                      |
| Requires simple, clear messages | Can handle some technical complexity |

This paper will focus particularly on messages used on sustainable plastics packaging that are visible to consumers and retailers. This messaging forms the critical communication link between concerned consumers and the plastics packaging sector (whose goals might traditionally be perceived by the public as not always supporting sustainability). As more sustainable plastics packaging is produced and used, it is important to consider how various messages meet (or fail to meet) goals of clarity and conformance with the Green Guides and basic ethical and verbal standards.

In an effort to understand better how messages can be used effectively to draw attention to the sustainability of product packaging, this paper will review examples of messages placed on packaging made with recycled plastic, bio-based plastic, or degradable plastic. This review will extend a discussion about the subtle difficulties of creating messages that are both honest and easily understood, to emphasize specific green, sustainable characteristics of the product packaging.

## Materials (Sample Messages)

The messages on packaging examined in this paper are limited to a sampling of labels from packaging made with recycled, recyclable, or bio-based plastics. (Scanned images of these labels are shown in the Appendix; the verbal content of each message is quoted and analyzed below.) To aid in an objective discussion, details identifying the brand of the packaged good are generally not mentioned unless relevant, and the packaged good is described below in a generic way. (Moreover, the exact composition of the plastic packaging's materials was not characterized physically. This paper's focus is not to investigate if the marketing claims are indeed physically accurate for each package. Rather, the focus is on whether the claims are clear, persuasive, and not likely to be interpreted as deceptive.)

## Examples & Analysis

An analysis of some current "green" messages on packaging material is useful for a discussion about such messages' effectiveness, at least in terms of Green Guides principles. Raw text from seven examples is quoted and analyzed below, distributed into three categories.

### Recyclable Plastic Packaging

Many plastics packages are *recyclable*, though only some are commonly accepted for recycling in processes that can accommodate their forms, colors, and contaminants. The common "chasing-arrows" symbol with a resin identification code often incorrectly implies to a consumer that a package can be accepted for

(continued on next page)

recycling. Proposed improvements on this familiar visual message will provide more useful information for consumers [11]. Meanwhile, other packaging messages can be used to draw attention to the fact that the plastic is indeed recyclable (under certain conditions), while also encouraging consumers to recycle and/or informing them how to recycle the product.

**Example 1:** “BRING IT BACK... THIS BAG IS RECYCLABLE.... [www.plasticbagrecycling.org](http://www.plasticbagrecycling.org) lists participating stores and outlets in your area.” (From text printed on an LDPE film bag used in newspaper delivery.)

This concise message simply commands the consumer to recycle, though without backing the command with a compelling reason. It does at least provide assistance for the consumer on finding where the bag is accepted for recycling. By doing so, it seems to imply, though not clearly, that the LDPE bag may not be accepted by a “substantial majority” ( $\geq 60\%$ ) of community recycling facilities, as specified in the Green Guides [5, §260.7; 6, §260.11]. The proposed Guides state that if the product is not accepted by a substantial majority of facilities, the message should clearly indicate that recycling facilities may only be available to a “significant percentage” of consumers (which would seem to apply in this case) or to “less than a significant percentage”; otherwise the message could be considered deceptive [6, §260.11].

**Example 2:** “Bag 2 Bag.... Our Environmental Promise... Plastic bags returned to this store will be recycled into new plastic bags... RECYCLE PLASTIC BAGS... This bag contains a minimum of 25% recycled material.” (From text printed on an HDPE supermarket bag.)

This message indicates that a program exists for recycling bags at the specific store, while also enhancing credibility that a used bag is considered valuable material for making new products.

### Recycled-Content Plastic Packaging

Plastic packaging manufacturers that incorporate recycled content face issues of accuracy and honesty in substantiating exactly what and how much recycled material the packaging contains. There is also a potential benefit in reporting on a package if the material contains pre-consumer or post-consumer recycled material, although the Green Guides do not require this distinction to be made in marketing messages [5, §260.7; 6, §260.12]. In Example 2, it’s unclear if the “25% recycled material” is from recycled post-consumed HDPE or pre-consumer scrap destined for the waste stream. (Being able to state it is 25% post-consumer content of course would make a bigger impact, given the pressures of bag bans.)

**Example 3:** “this container is made with... 100% RECYCLED PLASTIC” (From a thermoformed organic salad tray made from PET.)

As with Example 2, this message is still unclear as to the source of the recycled content, but it is not technically deceptive if the 100% level can be substantiated (unfortunately, the choice of the word “with” rather than “from” seems to introduce uncertainty about whether the *all* of the container’s plastic is recycled material).

**Example 4:** “Contains post-industrial recycled plastics.” (From a paper mailing envelope with cushioning bubble-film bonded to its interior.)

The claim assumes the consumer can distinguish between the plastic component and paper component of the mailer. The message at least is honest in making clear it contains “post-industrial” rather than post-consumer content, but it lacks a percentage figure for recycled content for the plastic component (with the unqualified word “contains” being vague, implying anywhere from  $<<1\%$  to 100% recycled content in the plastic). The proper qualification of claims is repeatedly stressed in the Green Guides [5, 6].

**Example 5:** “this container is made with... 100% RECYCLED PLASTIC... Our container is made from 100% RECYCLED PLASTIC! No new materials are used and it’s recyclable. We think Mother Nature would approve.” (From a thermoformed PET organic salad tray.)

The text in this message is repetitive, and it’s still unclear as to whether post-consumer recycled PET is used in the package. The “Mother Nature” reference obviously is intended to capture the emotions of consumers, though the message provides no specific information that stresses the real concrete benefits of the packaging for discerning readers. (However, unlike in Example 3, here at least the word “with” is clarified by the “from” in the next sentence and by the phrase “No new materials are used.”)

### Bio-Based Plastic Packaging

Renewable-resource-based plastics require consumers and retailers to make further discriminating judgments about the sustainability of packaging. Unqualified, vague claims about “renewable content” in the plastics only continue their confusion about bio-based and biodegradable plastics.

**Example 6:** “plantbottle™...\*up to 30% plant-based... 100% recyclable bottle... redesigned plastics, recyclable as ever” (From a PET water bottle.)

This label is from the much-publicized Coca-Cola “plantbottle” made from PET synthesized from bio-based mono-ethylene glycol, composing up to 30% of the PET. The concise message verifies for consumers that the bottle is still recyclable like other PET bottles. However, the statement “up to 30% plant-based” could be taken as meaning the given bottle could be 0% plant-based; here vagueness might be interpreted as deceptiveness.

**Example 7:** “Made with Renewable Resources Derived from Corn\*... \*The egg carton is made of annually renewable resources derived from corn instead of petroleum based components which are not sustainable. [The food manufacturer] is committed to reducing the amount of dioxin created by manufacturing, and to producing products that are safe and environmentally responsible.” (From the label on a thermoformed egg carton presumably made from polylactic acid [PLA].)

Although, Example 7 uses several words, it is still somewhat vague and raises several questionable issues. First, the label fails to educate the consumer that the material is indeed a *kind of plastic* which is “derived from corn.” The relative non-sustainability of “petroleum based components” is broadly stated without qualification; technically this claim would depend on the degree to which alternative traditional plastic cartons could be recycled, on how much energy they consume relative to bioresin production, and so on. The label also seems to imply that dioxin is traditionally associated with this kind of packaging, which is often made from non-chlorine-containing expanded polystyrene. This statement could be seen as a “free-of” type of claim defined the Green Guides, here being perhaps slightly deceptive as per the 2010 proposed Guides, since manufacturers would typically not use an egg carton packaging material associated with dioxin, and so cartons are normally “free of” dioxin [6, §260.9]. Overall, the label’s message focuses broadly on the projected ethos of the company rather than the specific benefits of the packaging.

## Discussion

The various messages above may (or may not) have been composed based on answers to key questions that the product or packaging maker considered in this “age of sustainability.” All of the following questions could be addressed before deciding on what message to send within the limited space available on most product packages. One question would be “Do we want to *educate* the consumer about the sustainability of our product?” and if so, “What do we want to educate them about?” Another question would be related to what degree the company wants to enhance its environmental image in the message, versus supporting the consumer’s desire to support the sustainable efforts the package demonstrates and reduce waste. Another obvious question concerns when a claim is

vague, irrelevant, unverified, or otherwise deceptive, thus overstepping the border of “greenwashing” – a phenomenon that is not always obvious (the Green Guides exist for this very reason). Some messages contain legitimate claims, but still could be edited to avoid greenwashing, as with Example 7 above.

The focus of the message should also fit the values of a maximum number of consumers. For instance, researchers have found the “duty-based” green messages are effective across a broad political cross-section of U.S. consumers [12]. These kinds of marketing messages frame recycling as an individual responsibility, or as a good, efficient business practice. Overall, this approach is said to be more effective than the use of common “global” messages about recycling, such as those related to preventing global warming and potentially divisive environmental issues. Thus, appealing to “Mother Nature” as in Example 5 may not connect with the broadest swath of consumers, while Example 2 claims that the store has a serious (and presumably economically feasible) bag recycling program.

Experts also advise appealing to customers using messages that are easily understood and able to be visualized [9]. The benefits of the package must be clear. Thus, for example, a message such as “Recycling this container provides valuable raw material that is an alternative to oil,” would send a clear message of efficiency. For bio-based plastic packaging, the “renewable resource” element could be made to sound efficient and compelling, as in “The plastic in this package is based on easy-to-grow sugar cane instead of limited fossil fuels.”

Of course, as stressed in the Green Guides, all the claims in these messages must be verifiable through testing via standard ASTM or other methods. For instance, testing must be able to show that a material said to be x% bio-based indeed meets that claim using the ASTM D6866 standard method. Similarly, a packaging product’s material prospectus must be traceable if it’s necessary to substantiate the claimed recycled content.

## Conclusions & Recommendations

The above brief analysis and overview leads to at least four conclusions, and invites further discussion on how to use words to state claims about sustainability. The points below call for further innovation in creating compelling messages on packaging that will lead to desired behaviors, including greater public acceptance of and interest in sustainable plastics packaging, greater interest in purchasing items using this packaging, and greater recycling of all packaging materials.

(continued on next page)

1. Especially in messages designed for consumers, the beneficial green characteristics of a package should be communicated in concrete terms that can be easily visualized by the reader. Consumers are more likely drawn to messages explaining a packaging's efficient use of materials and energy rather than broad environmental claims. And especially vivid messages can create concrete, easily understood visualizations in a consumer's mind, such as "By recycling [x number] of these containers, you save the equivalent of one quart of oil."

2. Vagueness about green benefits ultimately weakens a message about a plastic packaging product's sustainability, and can be interpreted as deception. Thus a message such as "Packaging made with recycled material," should become something like "At least half of the plastic in this package comes from recycled beverage bottles." Or, instead of a simple "Recyclable bag" message could be a message like: "This plastic bag required less energy to produce than a paper bag and is recyclable using the store's bag-collection program."

3. Manipulating or simply neglecting consumers' confusion about renewable, recycled, bio-based, and biodegradable plastics terminology can also be a form of deception. Rather, messages about sustainability should serve to educate consumers when possible. So rather than the misleading "Package is made from corn plastic – it biodegrades," could be an informing message such as "Package is made from corn-based PLA plastic, which is biodegradable in industrial composting operations."

4. Social-psychological effects should be considered when motivating consumer behavior with words. Messages should recognize that consumers' choices are primarily based on self-interest, but consumers are also open to being influenced by cues about what behaviors are socially appropriate when they are not certain what to do.

Messages should particularly take into account the disconnection between a consumer's beliefs about sustainability and their actual actions – that is, their "attitude-behavior gap," as the concept is known in the social sciences. In the case of plastics packaging recycling, beliefs about the importance of recycling are nice, but only behavior – actual recycling by consumers – will bring in a greater volume of material for the industry. The attitude-behavior gap can be reduced partly through proper messaging that makes it seem as if other, similar people are taking part in the same behaviors or efforts being promoted; for example, in a study about signs that encourage guests to reuse towels in hotel rooms, the message "Join Your Fellow Guests in Helping to Save the Environment," was reportedly more effective than general messages about "saving the environment" [13]. In the case of plastics packaging, this consideration, plus other points above, would result in an idealized message for a generic package, such as: "Efforts of people like you in recycling

this package help preserve our fossil-fuel resources." Such messaging can aid the packaging and plastics industries' efforts in satisfying their sustainability goals, as well as further the interests of concerned retailers and consumers. |

## References

1. "Improving on nature," *Compounding World* (2011 June).
2. Unruh, G., and Ettenson, R., "Growing Green," *Harvard Business Review* (2010 June).
3. Tolinski, M., *Plastics and Sustainability*. Hoboken, New Jersey, and Salem, Massachusetts: John Wiley & Sons and Scrivener Publishing (2012).
4. Walsh, B., "The perils of plastic," *Time*, [http://www.time.com/time/specials/packages/article/0,28804,1976909\\_1976908\\_1976938,00.html](http://www.time.com/time/specials/packages/article/0,28804,1976909_1976908_1976938,00.html) (2010 April 1)
5. *Part 260 – Guides for the Use of Environmental Marketing Claims*, <http://www.ftc.gov/bcp/grnrule/guides980427.htm> (1998).
6. *Proposed Revisions to the Green Guides*, <http://www.ftc.gov/os/fedreg/2010/october/101006greenguidesfrn.pdf> (2010).
7. "Green Guides Summary of Proposal" <http://www.ftc.gov/os/2010/10/101006greenguidesproposal.pdf> (2010).
8. Harris Interactive Inc., *Green Marketing Survey Methodology Report*, <http://www.ftc.gov/bcp/edu/microsites/energy/documents/Consumer-Perception-Study-Section-1-Methodology.pdf> (2009 November 3)
9. Verespej, M. "Expert: Consumers confused by terms like 'bio-based' and 'renewable'," *Plastics News*, <http://www.plasticsnews.com/headlines2.html?id=22616&channel=195> (2010 July 21)
10. Collins, M., "Industrial Marketing is Not Consumer Marketing," *Manufacturing Business Technology*, <http://www.mbtmag.com/Content.aspx?id=2778> (2011).
11. Verespej, M. "New package labels aim to simplify recycling," *Plastics News* (2011 May 23/30).
12. Lybecker, D., and McBeth, M. "We Want You to Recycle," *Resource Recycling* (2011 June).
13. Cox, R. *Environmental Communication and the Public Sphere*. Los Angeles: SAGE (2010).

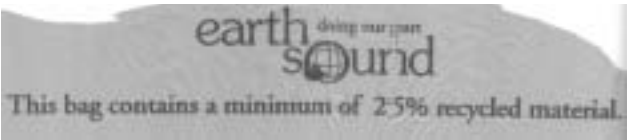
**Key Words:** green marketing, recycling, recyclable, bioplastics, greenwashing, Green Guides

Appendix

Example 1



Example 2 (side a & side b)



Example 3



Example 4



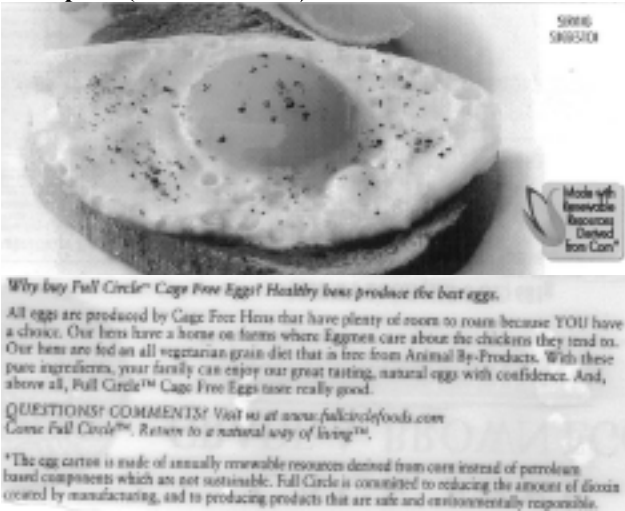
Example 5



Example 6



Example 7 (side a & side b)





**Roger Kipp**  
Councilor

# COUNCIL SUMMARY



I am pleased to provide a summary of SPE governance activities and updates on the state of our society. The last meeting of Council was held in Dearborn, MI from September 13th through September 15th. The council meeting and subsequent conference call meetings provided solid direction from the CEO of the society, Wim Devos, who emphasized that we must focus on establishing efficiency in effective leadership.

Wim's message is that SPE must be managed as a company focused on growth and profits. In order to accomplish this, a company needs to have the right people and the right structure. Wim was clear that we have the right people; it is the structure that needs attention. The growth/profit value for SPE will come from development of merging markets, improving operations and having an agile structure.

The promotion and marketing into emerging markets has been

effective for SPE, supported through the efforts of past president Ken Braney. This development can be seen by the continuing strong growth of international membership, the success of Eurotech and most recently, ANTEC Mumbai. These events clearly illustrate the success of SPE global expansion.

The challenge for our organization is in becoming more agile while implementing continuous improvement of operations. Wim pointed out to the council that we need to increase the speed of change, reduce the number of committees, clear out the complexities within the by-laws, and develop trust of the executive committee by council. These actions will cut the time to enact change and allow the council to be more effective in the areas where we can impact growth and profitability.

The structural changes will involve improved financial transparency through new

reporting procedures from staff to council, updated IT, and a major overhaul of the web site by adding content and eliminating complexity.

By-laws and policy changes have been presented to support these goals. The Finance Committee recommended and council approved a budget of \$90,000 for the upgrade to the IT system. One expected benefit from this change will be improved membership data and reports, expanding member communications and providing user-friendly membership and conference registration functions.

The improvements in IT and the web site are focused on supporting membership growth. The membership continues to hang in the 15,000 range. **Current member input is critical in addressing the improvements necessary for member value and growth. Please communicate to me your thoughts on website improvement or any other thoughts for an improved SPE experience.**

ANTEC 2012 in Orlando, held in conjunction with SPI, was a great success while ANTEC Mumbai (the first ANTEC outside North America) was successful both in attendance and profitability. For 2013 ANTEC will be in Cincinnati, OH from April 21st through April 25th. This ANTEC will have an expanded exhibit venue supported by SPI, however the technical presentations will remain the focus along with student participation. The Thermoforming Division continues to be one of the primary sponsors for student ANTEC travel and awards.

One of the most important missions of SPE is to attract and provide education for the next generation of plastics professionals. The sustainability of our industry depends on the success of students in plastics and polymer-related fields as they further their plastics education, enter into their chosen field and continue as SPE members. In order to support that mission the Society now has a new membership opportunity for future plastics engineers. Effective immediately, SPE Sections and Divisions can sponsor student members for 4 years of SPE membership for \$124.00. This will provide membership for the student throughout their

entire undergraduate years while those in the later stages of their education will get all benefits of SPE membership through their remaining years as students and their initial years as young professionals.

The SPE Foundation is now the home for the "Plastics Van Program." This program plays a vital part in our plastics manufacturing alliance with education. In order to promote interest to future plastics engineers, technicians and professionals, the excitement of plastics needs to be communicated to middle school students and teachers. The van program provides that conduit of energy into education. Please contact me or call SPE to discuss having the Plastics Van visit your school district.

Furthering the promotion of quality plastics education development, the Foundation voted to provide funding necessary for SPE to become part of the Accreditation Board for Engineering and Technology (ABET). This will provide SPE with a seat on the ABET Board sponsoring the field of plastics engineering and will allow SPE to be part of the auditing committee of plastics programs. Until the SPE Foundation's move to secure

a board position, plastics had no sponsor within ABET. This is a win-win for both groups as it provides ABET further credibility within the field of plastics while providing the same for SPE in the academic arena.

The next Council meeting is in Cincinnati at ANTEC. In the meantime, I will be representing the Division on the Finance Committee and the Foundation.

Thank you for your continued trust. |

**Roger C. Kipp**  
**Division Councilor**



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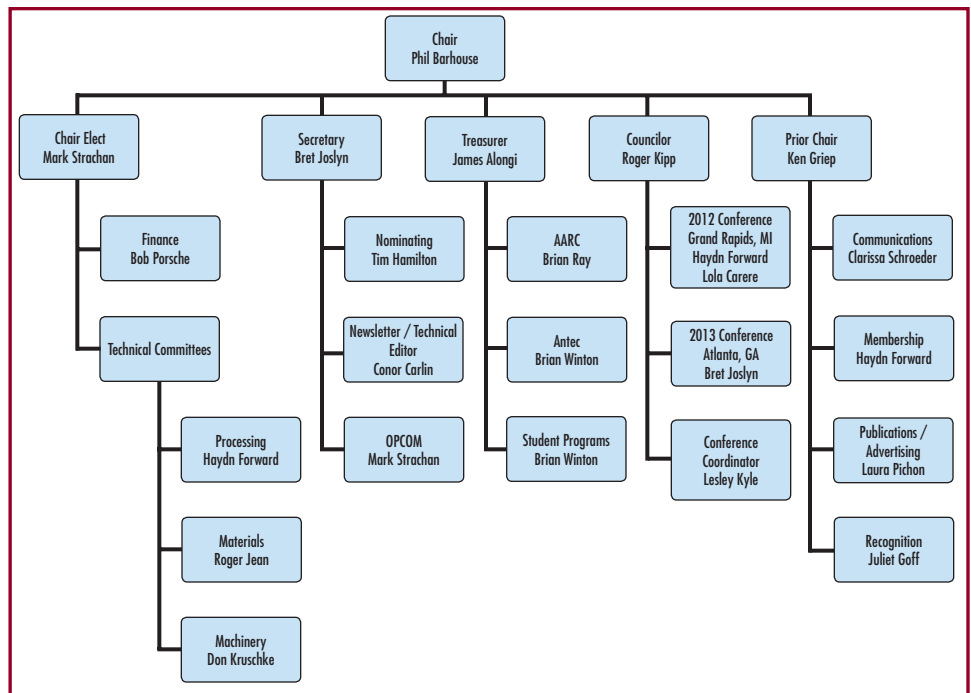
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