

# ***Melt Management Magazine*** **M<sup>3</sup>**

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***Piolax Corporation Uses Low Cost Technology to Get Product to Market Quicker, With Less Waste!***

**Helps Keep Automotive Program in U.S., Boosts Efficiencies Without Capital Equipment Outlay**

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# PIOLAX CORPORATION PARTNERS WITH BEAUMONT TECHNOLOGIES TO GET PRODUCT TO MARKET MORE QUICKLY

## ***MeltFlipper® and the Five Step Process™ Help Win Programs for US Automotive Molder***

"Find efficiencies in your plastics processing operation" is the mantra drilled into US molders seeking to maintain their position as high quality, competitive suppliers to large automotive OEM companies. It's no secret that North American molding operations are under pressure to scrutinize every area of their manufacturing operation, driving out waste in order to eek out fatter margins in an exceptionally competitive processing market. When Piolax Corporation of Canton, GA sought to streamline and drive inefficient practices for their Tier 1 automotive OEM molded parts business, they sought a solution that would provide faster cycle times, better quality parts, and reduced scrap – without investing in expensive capital equipment. With the help of their plastics supplier, Ashland Distribution Company of Dublin, OH, Piolax connected with Beaumont Technologies of Erie, PA to make their operations more efficient and competitive in the tough automotive molding marketplace.

Although the drive for improved efficiency is in nearly everyone's job description at Piolax Corporation, how to go about doing this was not easily apparent to this leading supplier of plastic and metal fastening products. With a major portion of the company's business coming from state-of-the-art plastics processing, staying on top of emerging processing technology while maintaining skills and a technological edge on the competition are a principal growth strategy for this Tier 1 supplier. It was their account executive, Mark Shade of Ashland distribution Company's General Polymer technology service group who originally approached Piolax regarding a new parts and process optimization technology. He had seen an alternative that could help processors drive out waste and add value to their end products.

While most efficiency solutions come in the form of a new machine, or a new automation system, what Shade recommended was radically different and substantially less costly. The solution came in the form of a product called MeltFipper™, a licensed technology from Beaumont Technologies which allows molders to use their existing tooling and machinery to their fullest potential, offering exceptional end products without any expensive machinery upgrades or purchases

### ***Choosing Technology Over Machinery***

The Ashland Distribution Company is challenged to help keep their customers competitive in the tough manufacturing business. In order to do so more effectively, Ashland set up

the General Polymer technology service group in 2000, with a mission to seek out and provide innovative processing solutions that can be implemented at competitive prices with minimal disruption to a manufacturing operation. The new division was tasked with connecting with companies in the plastics industry that provide such processing advantages, and their search lead to Beaumont Technologies of Erie, PA. Just a few years earlier, John Beaumont, Professor of Engineering



at the Plastics Technology faculty of Penn State Erie had presented a paper at an ANTEC conference that offered a simple yet revolutionary concept to the molding industry: the ability to control the molding process by managing the melt after the plastic had left the nozzle of the injection molding machine. At the conference, the paper went on to win the Best Paper Award, and the springboard to launch the new company. The concept presented in the paper, and now a licensed technology available too and used by molders worldwide, is called MeltFlipper® technology, and its simple execution yet exceptional results caught Shade's attention. He attended a presentation and trial run at an area molding shop, and found the premise of what John Beaumont was introducing to molders as a practical solution to mold balancing challenges.

"As soon as I learned more about the MeltFlipper, it was immediately apparent that Piolax could benefit from the

technology,” recalls Shade. He was so impressed with what the technology could do for the company that he scheduled a meeting with Piolax Corporation’s Molding Manager Joe Satterfield and Tooling Manager Jack Godfrey to introduce Beaumont and MeltFlipper technology to them.

Piolax Corporation’s dilemma centered on a molding program at the Canton, GA plant to mold glove box air damper parts for automotive OEM’s. At issue were scrap problems and inefficiencies and inconsistencies in the end products. Convinced that a ‘bigger hammer’ or expensive capital equipment would be costly and too time consuming, Piolax was intrigued about this PA-based company’s big idea for better molding.

### *MeltFlipper Technology Explained*

The MeltFlipper is a proprietary licensed technology that provides a mold imbalance solution by rotating the melt, thereby strategically repositioning the various melt regions to provide balanced filling between cavities. The benefits of this process, according to Dave Hoffman, Global Director, Technical Sales & Marketing at Beaumont Technologies, are that the molder can resolve mold-filling imbalances and reduce inconsistencies that limit the number of cavities used in injection molding molds. Further, the molder can balance pressure, temperature, viscosity, and material properties in the entire mold, instead of a more piecemeal solution as provided by steel balancing or conventional hot runner drop temperature manipulation. The unique processing advantage that the technology provides is the ability to control the plastics once it leaves the injection molding nozzle and flows into the mold cavities, without purchasing any new tooling. “A molder can quickly realize faster cycle times, better fill balancing that produces higher quality end parts while eliminating typical processing problems such as flash, short shots, dimensional variations, and core shift to name a few. The process yields higher mold efficiencies for lower per part prices, and faster mold commissioning times – all of which are essential in today’s global economy,” says Hoffman.

Basically, the process works by repositioning the side-to-side material property variation, created by shear in the runner system, so it becomes symmetrical to the vertical axis. When using MeltFlipper, each cavity get an equal share of high and low viscosity melt, and the repositioning requires a turning, or “flipping” of melt flow. Exact details are restricted to licensees of the technology, but the ‘guts’ of the process requires a minor mechanical variation to the runner geometry at or near the branching points.

### *Rising to the Challenge*

The problems that Piolax experienced with the air damper program were serious enough to warrant full analysis of what was going wrong in the molding process. The major issue was scrap and rejected parts, which in some cases were running as high as 30%. These figures were unacceptable to the company, explains Clyde Melton, Senior Vice President of Piolax Corporation. “We needed to trim our scrap levels significantly, so we could economize our raw materials and labor costs per part,” Melton explains.

Beaumont Technologies representatives traveled to the Georgia plant to diagnose the molding problems on-site. After tearing down the mold operation, the Beaumont team determined that the problems centered on 2 gates of a 4 cavity mold. The filling imbalances were creating a core shift problem, resulting in the long hollow handle component on the air chamber shaft displaying different wall thicknesses and unequal dimensional characteristics.

### *Using the Technology*

With the mold problems defined and located, Beaumont Technologies began to diagnose the ‘fix’ for the air damper molding program. First, Beaumont consultants along with Ashland Distribution personnel redesigned the runner system for geometrically balanced operations. Utilizing MeltFlipper technology, the team was able to fix the cavity-to-cavity problems and the intra-cavity inconsistencies for side-by-side compatibility. The net effect was that the two gates were filling at the same rate, and the materials was distributed evenly around the mold core utilizing the standard cold runner mold that Piolax has been using in the factory.

With Piolax licensing 3 molds with the MeltFlipper technology, Beaumont gave a presentation and seminar to the engineering staff to help them become experts in using the technology. Since the time of this initial project, the Piolax Corporation has opted to purchase a site license, which allows them to utilize MeltFlipper in all of their molds on-site, for new or existing production programs.

Beaumont was able to create these changes within 36 hours, dialing in the mold performance to a previously unprecedented level of accuracy and part-to-part consistency. The loose cores were tightened and the steel imbalances corrected to create the strong molding program that Piolax envisioned to mold the air dampers.

The results were dramatic. Piolax reduced their scrap problem from 30% to 2%, a 28% overall reduction in costly wasteful processes. Moreover, their cycle times were improved and machine time better utilized so that their productivity shot up 10%. These efficiencies have allowed the company to expand their air damper business to the point where today company officials claim that they have 85% of the air damper marketplace in North America and in Asia. And, since there was no new tooling, the company did not experience any downtime while learning new machinery or debugging it. The return on investment for the MeltFlipper investment was quickly realized, and the company now specifies the technology into all new bids where they compete. “Beaumont’s MeltFlipper technology helps keep us competitive, and the cost of implementing the process is very reasonable, so we are able to quickly turn out world-class parts with a very fast ROI for our company.” Melton states.

### *Achieving a Processing Advantage*

Building on the success of the MeltFlipper technology, Beaumont Technologies was able to further implement a new automated software product called the “5 Step Process™” for Piolax. The 5 Step Process allows molders to isolate mold variations by comparing the weights of parts from short shot

molded parts from each cavity, allowing the molder to recognize what is creating these variations. The 5 Step Process separates out the challenges of dimensional variations in the mold, cooling effects and shear-induced material property variations.

Some of the benefits that the process brings to a molder are: faster time-to-market through quicker mold commissioning, help in developing mold qualification standards and the ability to identify and quantify various sources of filling imbalances, with a focus on solving the root causes of filling imbalances. Further, it provides a window into a mold's quality and performance specifications. Lastly, the process is a self-contained database for easy file management, with an easy-to-read automatic report generator.

To achieve these benefits, Piolax submitted mold samples and parts molded during sort shot operations. Beaumont then weighed the parts and utilizing data collected during these tests, determined the mold steel variation during the mold cycle. Beaumont was able to calculate the shear induced variations, and came back to Piolax with solutions for better part-to-part dimensional accuracy for their end parts.

In addition, Beaumont representatives traveled to Piolax to host a seminar on using the 5 Step Process for the company's engineers, and taught them how to optimize their molding process. With the combined efforts of the two licensed tech-

nologies, Piolax was able to realize higher quality end parts with reduced cycle times, coupled with vastly improved efficiencies in machine time and materials use.

Today, Piolax quotes in and includes MeltFlipper and the 5 Step Process into all their new molding projects. The parts optimization technology from Beaumont has proven so valuable that the company accepts this low cost quality solution as a cost of doing a high quality molding program properly. The results speak for themselves. By finding ways to cut waste, drive out part-to-part imperfections, and utilize the injection molding machines and materials more efficiently, Piolax has streamlined its operation to be one of the most competitive molding operations in the world.

### **Conclusion / Company Contact Information**

For more information on melt rotation technology, sold under the trade name of MeltFlipper, or any of BTI's other products and services, contact: Marketing Department, Beaumont Technologies, Inc. 2103 East 33rd Street, Erie, PA 16510-2529. Tel:814-899-6390. Fax:814-899-7117. E-mail: [meltflipper@beaumontinc.com](mailto:meltflipper@beaumontinc.com) Web Site: [www.beaumontinc.com](http://www.beaumontinc.com).

*MeltFlipper, 5-Step Process and CAE by BTI are either trademarked or are registered trademarks of Beaumont Technologies, Inc.*

# Profits/Business/Your Competitive Edge Slipping Away?

## **Is it because:**

1. You aren't maximizing your molding capabilities?
2. Scrap and waste are cutting into your profits?
3. Startup is too slow, with mold debugging dragging you down?

## **Maybe it's time to get back to the basics.... using BTI's Technologies and Training Seminars**

- A series of on site-training courses to help your staff understand how to improve the molding process, commission molds faster and know what goes on inside the mold.
- Proven technologies that are guaranteed to help you go from art to part more quickly, and mold higher quality parts at the same time.

## **BTI...Industry's Source for Mold and Process Optimization Technologies and Training**



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