MeltFlipper® Case Study

"Our customers find that Viking can produce more products with faster mold commissioning times, faster cycle times and less scrap."
Marty Radock, Viking Plastics

"...using the new technology allowed the company to eliminate shorts shots and add 20 percent to their capacity to better serve a global automotive customer."
Shawn Gross, Viking Plastics

Customer:

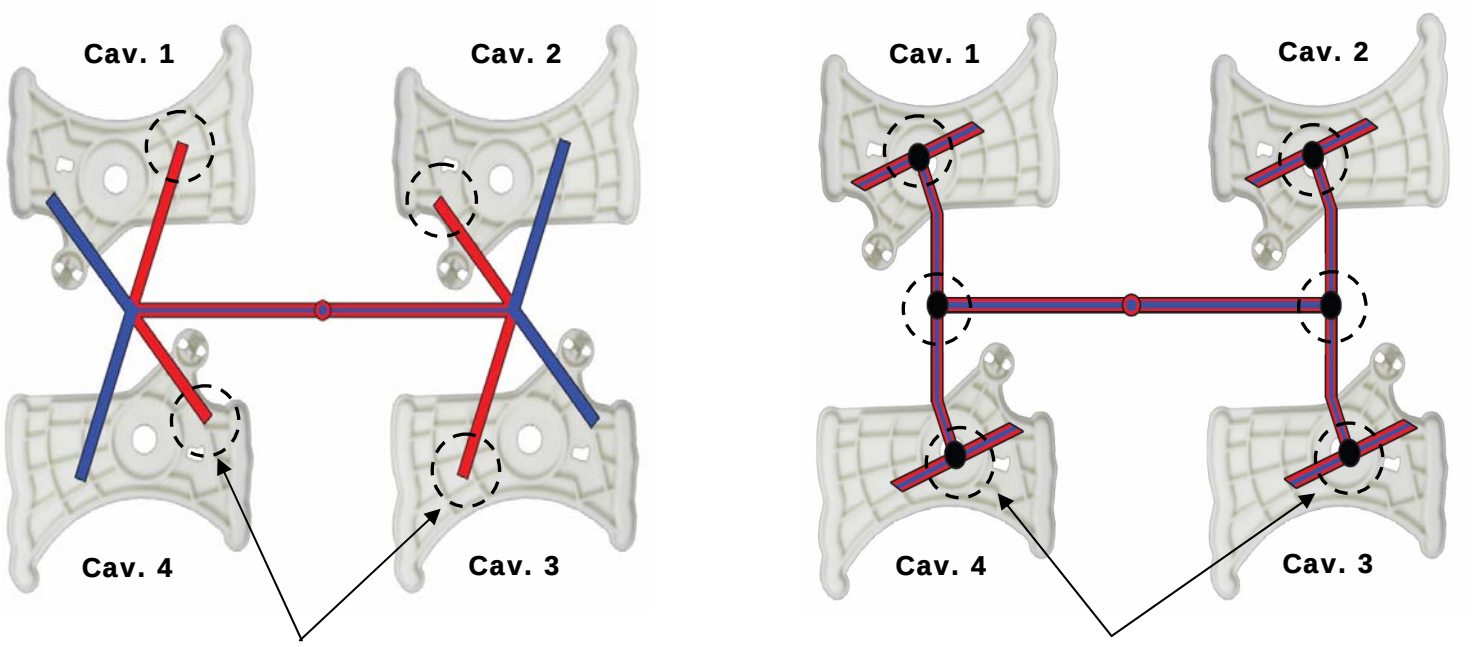
Case Study: Viking Plastics increases production output by implementing MeltFlipper technology in a 4-cavity automotive mold

Every custom molding facility has experienced their share of problematic tools. The problems may include: dimensional issues, surface defects, high scrap rates, long cycle times, and so on. One of these challenging tools for Viking Plastics, located in Corry, PA, was a 4-cavity mold producing a Delphi automotive component for the HVAC unit in a Saturn vehicle (Figure 1).

Upon receiving the tool, Viking found the mold was only capable of running at 75% capacity, at best. As a result, the machine, material, and inspections costs all increased beyond acceptable levels to maintain profitability. Rather than accepting these cost deficits, Viking contacted Beaumont Technologies Inc. (BTI) to see if BTI's MeltFlipper® technologies could correct the issue and bring the costs down. Viking has worked with BTI in the past therefore they, according to Program Manager Marty Radock, "we immediately knew there was a problem with an imbalanced tool and that the solution was MeltFlipper technology."

Figure 1: Delphi automotive components

Although the runner and gates were geometrically balanced, the problem lied within the distribution of the high sheared material *within* the cavities, referred to as an "intra-cavity" imbalance (Figure 2 Left). Due to the part orientation, the high sheared material filled the parts in different locations thus causing two distinct flow groups. As a result of these different material properties within the part, cavities 1 and 3 were filling faster at the base, whereas cavities 2 and 4 were filling faster at the neck. This caused problems with non-uniform packing pressures and dimensional stability. BTI and Viking decided to solve the root cause of the problem by adding MeltFlipper to the runner system. The melt rotations caused uniform flow of high sheared material to each gate and within both sides of the parts, regardless of orientation (Figure 2 Right).



High sheared laminates feeding different locations between cavities

Equal distribution of high sheared material with MeltFlipper technology

Figure 2 Left – The same part features in cavities 1 and 3 have different material properties than cavities 2 and 4 caused by the intra-cavity imbalance.
Right - All part features receive identical material properties, thereby eliminating the intra-cavity imbalance by adding MeltFlipper® technology in the mold.

By implementing MeltFlipper, Viking noticed a complete turn around in the performance and profit of the tool. MeltFlipper technology reduced the machine, material, maintenance, and inspection costs (Figure 3 Left). Ultimately by reducing these costs, Viking saw an annual production savings of $32,470 (Figure 3 Right). By controlling the rheology to ensure uniform material properties within each cavity, Viking will have saved nearly $114,000 over the life of this project.

Radock states, “With a balance of filling AND material properties, we can achieve full cavitation levels without sacrifices in part quality. We are now adding MeltFlipper technology as part of all new mold quotes.” In addition to Radock's comment, Shawn Gross, Viking's Manufacturing Manager says: “With the BTI technology, we eliminated the short shot rejects and added 20% to our capacity".

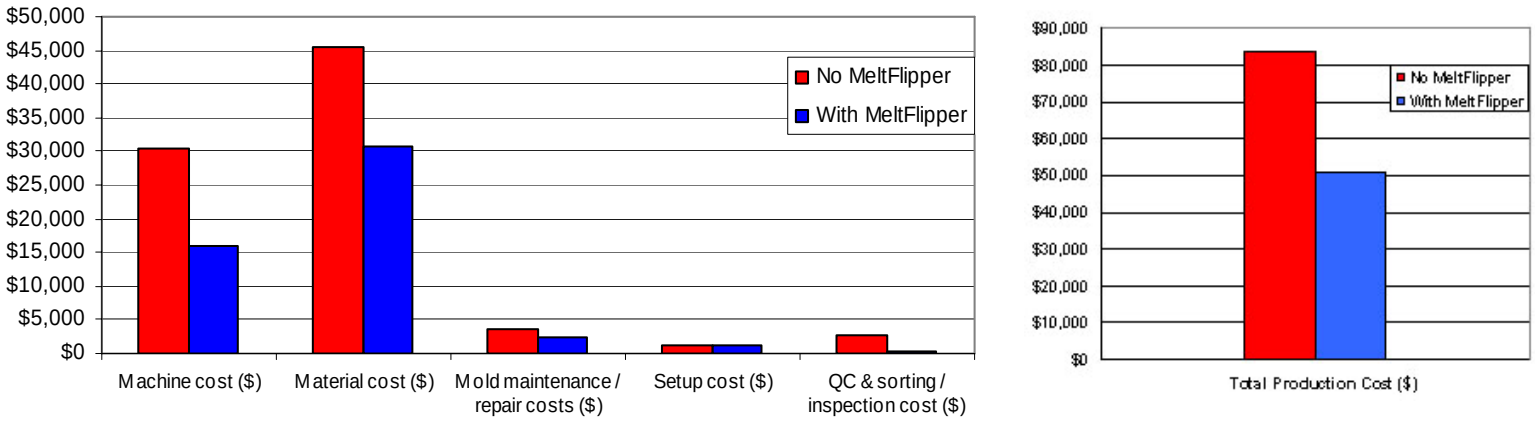


Figure 3 Left - Comparison of the individual costs before and after incorporating the MeltFlipper technology
Right- Total Production costs before and after incorporating the MeltFlipper technology