

MeltFlipper® Case Study



Case Study: Twinshot meets MeltFlipper - A beautiful combination for reducing scrap and increasing part aesthetics

DUNDEE, MI (August, 2004) - One would think that an established custom molder, in business since 1948, would profess to know both the trade, and "all the tricks" of molding quality plastic parts. In addition, resistance to change, having demonstrated a mastery of their trade, might be expected.

Not so with Motor City Plastics of Dundee, Michigan, a custom molder whose name belies the fact that they are much more than automotive parts molders. Motor City is actually an innovative, high tech molder that engages in quite a diverse range of materials and products. As a result, they are quite open to technologies that make them more competitive and build better quality parts for their customers.

The problem at Motor City Plastics, Engineer Chris Yochim was facing a dilemma in trying to achieve the ultimate cosmetic case over cap for a leading cosmetics manufacturer. Needing a solution to the mold's propensity for producing unacceptable parts because the 16-cavity mold would not balance and parts came out with both flash and heavy sink marks.

The solution to this setback was combining MeltFlipper® technology-to balance the mold filling -- and the 5 Step Process™ -- to debug the imbalances -- with Spirex's Twinshot® co-injection process Together, they achieved what Motor City acknowledged to be the perfect molded part for their cosmetics company customer.



Relationships, Once Started, Run Deep

Personal relationships often run stronger and deeper than just a business relationship. Despite efforts by Chris Yochim and his engineering staff to find a solution, nothing seemed to work. Thus, Chris, a graduate of the plastic engineering technology program at Penn State, Behrend (Erie, PA), remembered that his professor, along with a related company, Beaumont Technologies, Inc., often solved problems from within the mold. This inward looking approach seemed more appropriate to the problem, instead of blaming poor results on the polymer, the mold, or the machine.

Yochim wanted Motor City to be able to incorporate the proven twinshot co-injection technology from Spirex Corporation into any new solution to the molding problem. Professor John Beaumont quickly responded with two recommendations. These were to employ both a new licensed process technology, and to get the mold fully debugged with the company's software-based solution program.

Troublesome Startup to Perfect Parts

Startup - Motor City wanted to use Twinshot co-injection technology from Spirex in order to achieve a highly cosmetic look for the product. The molder and both technology providers worked together and found that in a short shot study of the 16-cavity mold, the mold was imbalanced, resulting in flash on some cavities and heavy sink marks on others in the product. The parts, from cavity to cavity, each displayed a different percentage of skin (ABS) versus core material. The reason for this is that the shear imbalances in the mold were causing some cavities to receive more skin material than others. As a solution to this nagging issue, MeltFlipper melt rotation technology was suggested by Spirex.

After exhausting all the other variables, Yochim placed an emergency call to Prof. Beaumont; in which his company offers melt rotation technology. Motor City then proceeded to supply sample parts and runners at headquarter facilities of Beaumont Technologies, Inc. (BTI) in Erie.

A quick look at the runner layout revealed both a steel problem (one primary runner was found to be longer than the other was), along with shear induced flow problems. MeltFlipper technology was designed to compensate for the flow length problem and to eliminate the shear induced filling imbalance, thereby eliminating the flashing and heavy sink marks on the finished product. The solution to solving these processing problems was corrected by means of melt rotation technology and special mold debugging software (The 5 Step Process - also from BTI). After the melt-rotation technology was designed, and a full runner analysis had been done, the mold was returned to Motor City.

"We were confident Motor City was close to a solution," recalls Plastics Engineer Yochim, "The balanced runner system from BTI, mold debugging and commissioning software also from BTI combined with the Spirex twinshot process almost immediately gave us the results we both needed and required."

After the MeltFlipper was implemented, continues Yochim, "The short shot study proved that the mold was almost perfectly balanced and we commissioned the mold nearly as fast. We began molding parts without flash and sink marks, all parts also had a similar percentage of skin versus core material. More than 1,200 parts were produced with 5 different ABS samples in less than 4 hours."