# MeltFlipper® Case Study

**Case Study:** Controlling gas-assisted molding through MeltFlipper® technology

The runner system was a geometrically balanced 4-cavity layout with gas pins located at each automotive door handle part. The problem was a 50 % scrap rate due to warp. The warp was only a problem on the inside two cavities. After the customer noticed that the inside cavities were filling before the outside cavities, they tried to artificially balance the runner by choking down the runner diameter to create a pressure balance (Figure 1). This approach sporadically created four cavities within specification during the first trial run. However, because the original proposed solution was only a pressure balance, the customer could not repeat the results again and spent days of press and tooling time trying to achieve parts within specification.

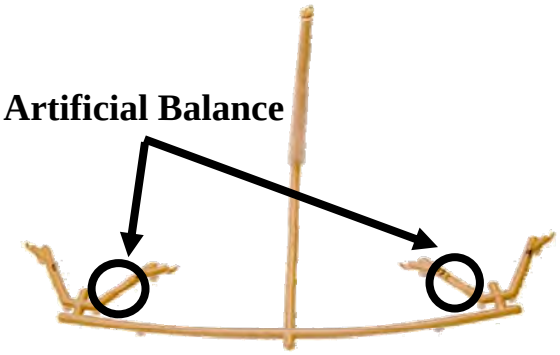


**Figure 1:** 4-Cavity runner layout for automotive handle showing areas with attempted artificial balance.

Upon further diagnosis and by cross-sectioning the parts, it was noticed that the gas channel in the inside cavities was off center. This created a thick section at the bottom of the part, which in turn was creating the warping issue (Figure 2). To explain this, consider there is more plastic in the inside cavities - creating different unfilled volumes within the cavity groups (inside vs. outside) before the gas is injected. In other words, if there is more plastic in the inside cavities, there is less volume for the gas to be injected into. Therefore each group of parts were receiving different volumes of gas, thus creating the different gas channel results.


**Figure 2:** Part cross-sections illustrating the gas channel differences between the inside cavities versus the outside cavities.

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The customer approached Beaumont Technologies to solve the problem through MeltFlipper technology. BTI applied a variation of the MeltFlipper technology to the runner system and balanced out the material flow and properties to each cavity as seen by the short shots in Figure 3.

The results of this case study after applying the MeltFlipper technology showed that all four cavities were now within specification. Upon cross-sectioning the parts, it was seen that the gas channel on the inside cavities now matched nearly identical to the outer cavities (Figure 4). Since the volume of plastic in each cavity was now equal, the amount of gas was now equal. By balancing the flow and material properties, the MeltFlipper technology eliminated the thick section at the bottom of the inside cavities and reduced the warp in those parts.

**Figure 3:** Short shot results after the MeltFlipper technology was applied, showing all cavities filling uniformly.

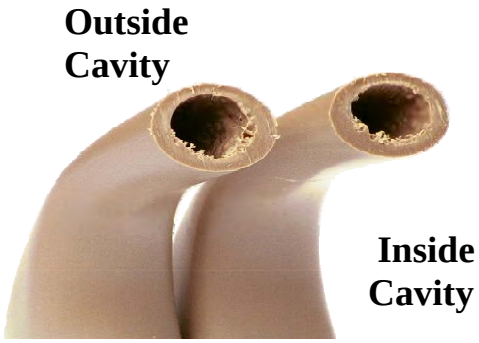


**Figure 4:** Part cross-sections illustrating the gas channel differences between the inside cavities versus the outside cavities after applying the MeltFlipper melt-management technology.