CASE STUDIES

Impossible to Possible

Thin Wall Micro Molding: Medical Micro Components for a Drug Delivery System

When a large medical equipment manufacturer was searching for a micro molding alternative to an inefficient process, the word “no” came up in every vendor conversation. That is, until they came to MTD Micro Molding and found their “yes.”

Thin Wall Micro Molding

Our customer had designed a thin wall micro molding, plastic part with a fairly long flow length for use as a medical micro component of a drug delivery system. The vendor manufacturing the part used an extrusion and forming process that resulted in some defective products and a fair amount of fallout.

In order to improve yield, quality and cost-efficiency, our customer decided to explore other options. They believed micro molding would give them the outcome they wanted, but the manufacturers they contacted said it simply couldn’t be done.

One vendor finally suggested the medical equipment manufacturer talk to MTD, a micro medical device manufacturer. With our reputation for innovative processes and top engineering talent, the vendor said, we might offer a solution to the medical micro component project.

Burned by so many rejections, our customer reluctantly decided to try one more time and gave us a call. Their perseverance proved the value of never taking “no” as the final answer.

Flawless tooling execution with a slight design change

Our first priority was to show the thin wall medical micro component could be successfully made. So during a tour of our facilities, we shared samples of high-aspect-ratio parts that were built via thin wall micro molding. This demonstrated our ability to produce results that were similar to the customer's desired geometry.

Here's what led to project success as the part moved through the process:

Flawless tooling execution along with a slight design change made the difference. At MTD, we work with customers on design considerations, arriving at a solution that meets their needs while maximizing manufacturability.

Sometimes, even a seemingly minor change to a design can have a significant impact on manufacturing and project success. For example, this project involved adding draft within the original tolerance to release the medical micro component from the mold.

While other vendors looked at the part and saw only why it couldn't be manufactured, we saw the possibilities, and what needed to be done differently. The part's design presented a considerable challenge, but our flawless tooling execution was the key to success.

Presenting alternative materials further increased success. Similar to changes in design, exploring other options for thin wall molding materials can boost a project's chances for manufacturing success. When the customer asked for a specific type of material for the part, MTD presented alternatives that would provide the same properties while improving manufacturability.

Before a project begins, we perform a process failure mode and effects analysis (PFMEA) to create contingency plans with regard to material, design and tooling. For example, the material this customer preferred turned out to be less advantageous for the medical micro component molding process. Because of the early discussion about other materials, we could quickly switch to a more appropriate material and move the project forward uninterrupted.

Challenge

Solution

Results

Customer at a Glance

Higher yield, better quality, lower cost thin wall medical micro components

MTD was able to achieve the customer's key goals, including higher yield, better quality and lower costs.

Being told "no" so often had almost led our customer to believe they had unrealistic expectations. In essence, they had received "false negatives" and claims that the part couldn't be made even though it could. A false negative can kill a program or cause a company to needlessly compromise on design.

Due to these false negatives, the customer was initially skeptical of our assurance that we could deliver the thin wall micro molding part successfully. But as the project unfolded, they came to realize we could provide the manufacturing efficiency they needed while keeping costs under control.

Having seen similar geometries of high-aspect ratio parts during their plant tour of MTD, followed by a flawless execution of the tool build and delivery of successful parts, our customer came to realize they were right from the start: Micro molding was the way to go. They'd just needed a vendor that could make it happen.

The bottom line: With MTD, "impossible" isn't always the final word on a project.