



CASE STUDY- Surgical Technologies

MEMS Based Drainage Device



Medical Condition/Clinical Need: This device will be used post operatively to accurately measure fluid flow from a surgical wound, leveraging a miniaturized MEMS (Micro-electromechanical Systems) based flow sensor that could provide flow rates and store them electronically.

The Challenge: The client came to Arterex with a finished design and an in-house manufacturing yield of only 50%. The device and process had to be reviewed, as a Design for Manufacturability had been conducted to improve the overall design and process. This approach to product testing was able to provide a smooth transition into manufacturing the device at acceptable yields for volumes of up to 60,000 units per year.

The Design/Manufacturing Solution: The Arterex engineering team reviewed the design and process to determine the root cause of failed devices, which had been coming from the production line. The failures were found to be leaking and poorly performing their expected flow rate. It was believed that an inconsistent ultrasonic weld process was the root cause. Arterex engineers redesigned the mating energy director features of the top cover and base reservoir, built new mold tooling and ultrasonic weld tooling and completed a Design of Experiments to maximize the efficiency of the ultrasonic weld process. Once it was proven that the welds were the reason for the leaks as well as poor performance with no remediation to follow, the client then transferred the manufacturing practices of the device to Arterex.

Results: The build process developed at Arterex ran at a greater than 95% yield. The product was able to be built at the required cost and quality levels at Arterex until the product outlived its lifecycle.