

PROJECT BRIEF - HIGH PURITY

Semiconductor Chip Equipment Manufacturer Saves 10-15% on Rotationally Molded Dosing Bottles

BACKGROUND

In 2016, a well-known chip equipment manufacturer was looking for a new way to manufacture dosing bottles for the next version of a tool used in electrochemical deposition processes.

Having previously worked with RMB Products on other solutions, such as tanks and fluid handling ducts, the manufacturer was confident in the capabilities and processes offered. For this reason, a representative from the chip equipment manufacturer contacted the RMB team to provide a solution for this important component to the project.

CHALLENGE

Previous versions of this tool use a dosing bottle that is constructed from welded sheets of polypropylene. This dosing bottle holds hydrochloric acid, which is a highly corrosive fluid. This acid causes the tool's dosing bottle to corrode and fluid to leak through the seams, causing contamination and safety hazards for the end user.

These issues require expensive tool maintenance in the field and the chip equipment manufacturer wanted to safeguard against corroding and leaking in the newest version of the dosing bottles.



SOLUTION

The RMB sales team proposed a rotationally-molded dosing bottle that included post-molding assembly. This included the installation of subcomponents such as ports, openings, dip tubes, a liquid level sensor, and a graduation sticker. The dosing bottle would then be ready for installation once received by the chip equipment manufacturer.

The material proposed was polypropylene, which met the chemical, temperature, purity, and cost requirements of the customer. The specifications also called for a transparent material to view the liquid level from outside the bottle, and polypropylene meets those needs.

The RMB sales team also explained the upfront costs associated with a project like this. Creating the mold and the engineering design was costly, but these are non-reoccurring costs. The return on investment per part could be realized within as little as one year.

The chip equipment manufacturer accepted the proposal. Over the course of a year, the engineers from the chip manufacturer and RMB worked together to design new drawings and tooling for the rotational molding process. The combined team ended up with designs for seven versions of leak-proof dosing bottles that have no seams, ranging from 3 liters to 20 liters, for the seven different sizes of the tool.



RESULTS

The team from the chip equipment manufacturer was pleased with the new seamless dosing bottles. They anticipate that future leaking will be significantly reduced, which means less replacement of the bottles at their customers' facilities as well as a significant decrease in machine downtime. In turn, the service life of the equipment will be longer and provide the end users with a more reliable product.

Using a rotational molded dosing bottle with already installed components has saved the chip manufacturer 10-15% in production costs alone. Having ready-to-install parts also makes the process more efficient.



PROCESS

From design to production, the entire process took one year.

