How an Injection Molder And Prototype House Drive Time-to-Market

Collaborative product development between an injection molder and a prototype house significantly reduces time-to-market and helps OEMs maintain a competitive advantage.

Ric Perry

EMC Corporation — a provider of information storage systems, software, networks and services — needed to produce a cabinet door for its new-generation Symmetrix family of data warehousing systems. To take time out of the project, Mack Molding Co. (Arlington, VT) — an injection molder — managed a parallel tooling/prototyping program with its rapid prototyping and tooling division, Mack Prototype, Inc. (Gardner, MA) so that the minute the prototype was verified, final machining on the tools could be initiated.

CNC Machining — Cost-Effective Solution for Large Prototypes

There are four doors in the program — three measuring 70" x 22" x 3" and the other 44" x 20.5" x 4.25". There also are numerous grills. Mack Prototype CNC-machined and fabricated an ABS master of the 70-inch door and produced several polyurethane prototypes from an RTV rubber mold to prove out the design. It also made six SLA masters and a six-cavity rubber mold for the louvers and CNC-machined an acrylic master for the status panel that was to be molded in clear polyurethane with tint.

Time-to-market is greatly influenced by whether or not you're employing the right resources and tools to do the job.

Close communication among the OEM, molder and prototyper allowed the moldmaker to get a jump-start on the tooling, which shaved four weeks from the overall product development cycle.

But even beyond that, prototyping provided the customer with its first look at the product out of the CAD station — the first time they could take a door, put it on a cabinet and look at its features. As a result, modifications were made before transitioning to steel tooling, generating further time and cost savings.

Machining the prototype of the door out of a solid was much more cost-effective than producing numerous SLA sections and gluing them together — an estimated 50 percent cost savings. While Mack Prototype offers both SLA and SLS and promotes the use of those technologies, this large-part project proved that they are not the only — or sometimes even the best — solutions. This is a perfect illustration of collaborative engineering at the total project level, which allowed Mack to develop a plan

Photo courtesy of Mack Prototype.

One of the three versions of the 70" x 22" x 3" door is customized for the new generation of the EMC Celerra network-attached file server. The prototype of the 70-inch door was CNC-machined and fabricated from an ABS solid, a much more cost-effective approach than producing numerous SLA sections and gluing them together.

that accomplished the goals of both the engineer and project manager.

Three Doors, One Mold, More Savings

Mack Molding molds three versions of the large structural foam door with one tool via removable, interchangeable inserts — a design effort that triggered further savings in the overall tooling budget.

The company uses a four-drop, valve gate manifold on the part that gates directly into the cosmetic surface. The manifold is equipped with a sequencer so that the gates are opened at different times to improve processing. The net effect of this approach is a smaller, more compact tool that can run a faster cycle in a smaller press.

The structural foam doors are molded on a 1,500-ton press of ppo resin and painted with a three-coat process. Each door holds 14 louvers, which are injection molded of PC/ABS resin. The final component is a tinted transparent status panel that is molded of polycarbonate resin.

An OEM's competitive advantage in new product development (which translates directly to the bottom line) is significantly impacted by time-to-market. In turn, time-to-market is greatly influenced by whether or not you're employing the right resources and tools to do the job.

In rapid prototyping and tooling, the colloquialism, "one size fits all," definitely does not apply — matching the correct technology to the application is the key to bottom line savings in both cost and time-to-market.

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CNC-machining can be a cost-effective alternative for large-part prototyping.

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