

Faster Prototyping *Speeds* Products to the Front

Applied Marine Technology, Inc. (AMTI) provides professional and technical services and specialized products for Homeland Security. Since 1991, the Virginia Beach VA company has grown from a three-man organization supporting Naval Special Warfare Operations to one with over 500 employees serving both government and private sector organizations. Initially the company's focus was on services related to terrorism, vulnerability assessment, and preparedness. For the last five years, along with expanded services – training and exercises, information systems and communications, systems engineering and integration, and visual communications – AMTI has been providing specialized products and rapid prototyping of unique technical solutions as well.

Mike Crumpler, Director of Engineering at AMTI, was hired when the company started developing products. His technical solutions group now makes up about 10 percent of the company's staff and provides military and law enforcement clients with hand-held and vehicle-based communications equipment, IED (improvised explosive device) training products, specialized robots, and the QuickLock' Secure Cargo System.

The company's field proven communications devices are small, powerful, and weatherproof. IED training devices range from rocket launchers and inert explosive charges to mock suicide vests. Two models of Seeker™ Series Robots are designed to help operators detect and defeat improvised explosives by safely placing an remote controlled charge near the IED to aid in its destruction. The QuickLock' Secure Cargo System facilitates tie-down of any cargo, regardless of shape. It allows quick, easy installation, provides hundreds of tie-down points, fits a variety of vehicles, and accommodates a range of modular accessories.

“One of the first products we developed was a radio amplifier,” says Crumpler. We were looking at machining prototypes, but the chassis we were working on would have cost \$4000 and taken four weeks to machine. We kept looking and found Protomold, which delivered the prototype in a week at about half the cost.”

Since then, AMTI has made extensive use of Protomold's services. “We use Protomold in our design process when we're ready for higher end models,” says Crumpler. “Stereolithography is fast and inexpensive, but an SLA model is physically weak and can be less accurate than Protomold's injection molded parts. Considering the environments in which our products are used, fine tolerances and high strength are critical.”

“We have nothing against SLA. In fact we have our own on-site SLA equipment and can turn out SLA prototypes in a matter of minutes, but they can only take us so far. Protomold parts may cost a little more but they parts have significant benefits including being a lot more durable. We design our parts with Pro/ENGINEER software and send them online to Protomold's ProtoQuote“ for analysis and pricing. The feedback we get has been very useful and has helped us develop better models quicker. We weren't plastic experts, but we've learned a lot working with ProtoQuote and Protomold.”



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In addition to standard prototyping of plastic parts, AMTI has some unusual uses for rapid injection molding. “We sometimes use plastic parts from Protomold to prototype metal parts,” says Crumpler. “Plastic may not have all the characteristics of metal, but with rapid injection molding we can get an excellent idea of the fit. And even if we only need a few prototypes it’s a lot less expensive than machining or casting prototypes in metal.”

AMTI also uses Protomold for production of some of their plastic parts. “A lot of our products were for SOF (special operations forces), small specialized groups, so our production runs were limited, averaging maybe 500 pieces over the life of the product,” Crumpler says. “Lately we’ve been broadening our customer base, selling to larger groups, but our production runs are still small enough to make working through Protomold very cost effective.”

“One product included six different parts manufactured by Protomold, and we sold about 800 of them over the course of several production runs. The quality from Protomold was excellent, the price was reasonable, and the turnaround was fast. Some of the prices we’ve been quoted for production by traditional molders have been ridiculous. I’d say that we’d have to be approaching 10 thousand copies of a part to seriously consider moving to a traditional molder.”

“For prototyping, we can usually go from a first CAD model to placing an order in about three days. Then we can have parts in 5 to 10 days.”

Pete Decker is the AMTI engineer who actually “discovered” Protomold. “It’s been a good experience,” he says. “We’d done metal castings, but we didn’t really have much experience with plastic. The folks at Protomold were very helpful, and we were amazed at the speed with which we got parts. Of course our in-house SLA equipment is faster, but melted Delrin® just isn’t that strong. Even in the development stage, we need a better idea of how strong a design is going to be in production. And if a prototype turns out to be what we’re looking for, we’ll have Protomold put it straight into production for us with the same mold and material.”

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On the other hand, Decker points out, many prototypes turn out to be far from production ready. On a recent project, Protomold was producing multiple parts for device, which designers had to take through four full iterations. “The changes were small but critical,” he says. “The device had to be quickly accessible for a soldier in the field, and our first models were getting hung up. We had to adjust the size and shape of various parts of the device so it could be easily deployed. We were way past the SLA stage, and with that many iterations, other prototyping methods would have been cost prohibitive. Protomold helps us fine tune our designs without a lot of cost or delay.”

AMTI engineers are enthusiastic about Protomold parts, but so are the company’s salespeople. “They use prototypes to get orders at trade shows before a device even goes into production,” says Decker. “When our customers see something they like, they usually want it right away. The best part is that we know that if the demand is there, we can Protomold working on production parts quickly. For prototyping, we can usually go from a first CAD model to placing an order in about three days. Then we can have parts in five to 10 days, and Protomold always keeps their promises.”

“A lot of our interaction with Protomold is automated and online,” says Mike Crumpler, “but they’re always available if we need to talk to a specialist. We had one part that was produced to our specs, but was warping. We thought about changing the design, but consulted with Protomold and ended up changing the material instead, which solved the problem.”

“Without Protomold, our development costs would be higher, and our production costs would probably be higher as well. If we raised prices to our customers to make up the difference, we might sell fewer pieces. Either way, our ROI would be hurt, and our time to market would be significantly longer. This way, we can deliver better products, faster and less expensively, which is good for us and good for our customers. I’d recommend Protomold to anyone facing similar quality and time pressures.”