

## FDM Pumps Up Toy Modeler's Output

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— Joe Pizzo, RM&P

*Preliminary CAD design of a Super Soaker water gun.*

Rapid Models and Prototypes, Inc. (RM&P) is a full service product-development house, model shop and rapid prototyping service located in Runnemede, New Jersey. For 41 years, the company has supplied model-making services to Fortune 500 and other high-profile companies.

RM&P creates models with end purposes ranging from the very serious – such as containing and transporting nuclear waste, to the more frivolous – such as toy water guns. "Clients can give us a file, a drawing, or even just relate their concept to us, and we can create a model for them," says President, Joe Pizzo. "And we can turn around and do low production runs as well. We can do that in urethane, acrylic, polystyrene, or rubber."

RM&P added Fused Deposition Modeling (FDM) rapid prototyping to its services a few years ago, and Pizzo says it has greatly expanded the company's capabilities. "There are things we're doing on our FDM system now that are virtually impossible for a traditional model maker to do," he says. "When I saw the Stratasys FDM systems demonstrated, and I realized the ABS-plastic models had the strength I needed to do my own modeling work, not to mention service bureau work, I jumped at the chance. We use a lot of ABS in our final products here, so it's an advantage to prototype with the same material. "Besides having the part durability that I wanted, the FDM systems offer an environmentally clean process. Some of the other rapid prototyping systems out there use chemicals that are toxic. I don't want to be anywhere near that kind of environment. And I'm in New Jersey; they really hit you with the EPA regulations."

### Subcontracting for the North Pole

A significant portion of RM&P revenues come from the toy industry. On any given day, a visitor to the shop will often see, in various stages of development, an assortment of models, such as the toy train, rubber football, or Star Wars action figures RM&P recently completed. "Among other things, we're currently designing the holiday toy display for the Macy's Department Store window," Pizzo says. "It's September, and we've been working from 8:00 to 8:00. Christmas only comes on the 25th." One of Laramie Toys' product lines, well known by kids, is the Super Soaker line of water guns.

Pizzo recently completed the PowerPack Backpack model water pistol. The model comprises six components and includes a water-tight body. The components include left- and right-hand sections of the body; a solid trigger; a decorative, segmented

top piece, which resembles a carrying handle; an endpiece with five pretend revolving barrels; and a pretend dial on the top. "Some other rapid prototypes can get soft when exposed to moisture," says Pizzo, "but with the FDM system, I constructed a vessel that actually holds water without absorbing any! That capability was a real plus.

### RP System or Machining Center?

Pizzo likes to think of their FDM system as a machining center, he says. "I've said this many times – I really believe this machine is not so much a prototyping system as it is a machining center. Because if I can make two, three, four different brackets and holding devices and clamps within the same mechanism, then I don't have to put it on the milling machine, I don't have to turn it on a lathe. And I don't have to order various raw materials and hope they arrive on time and within the right tolerance. I don't have to weld or screw components together. I just design it all into one piece. No matter how difficult a design is, the machine builds it, no problem – that's the beauty of it. For two mating components, I even made threads that held up under pressure. With the FDM system, I've made very fine threads that fit together well the first time." As far as general time savings with the FDM system, Pizzo says he roughly cut his work in half. "With some longer and some shorter projects, on average, my jobs used to take eight weeks before we brought the FDM machine in-house. Now they normally take four weeks, so I'm seeing a time savings of 50 percent. That means a lot to me."

Pizzo also says that because the machine operates constantly, it brings in solid revenues even when the shop is closed. "The machine is making money for me. It's working from 8:00 to 8:00 – to 8:00. I doubled production with it – I get 200 percent out of my shop instead of 100 – I think that's pretty good."



*A working ABS plastic prototype of a Super Soaker water gun.*



*This Super Soaker, disguised as a cell phone for sneak attacks, was modeled using FDM.*

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