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Fast, Functional Prototypes at designunlimited

by Brad Cleveland, Protomold | Published December 13, 2007

"In product development, time is your enemy," says Jim Ventress. He and partner Tim Humphrey own designunlimited, serving clients in medical products, communications equipment, data processing products, outdoor machinery, automotive equipment, toys, and more. "Cost is sometimes an issue, but time always is, especially now, with product life getting shorter and shorter. Innovation isn't enough. You have to be early to market just to maintain market share, let alone increase it."



Trimming Development Time

The group's work with plastic typifies their development process. Designs begin as sketches and progress to software prototyping. "Programs like Pro/ENGINEER or SolidWorks let us begin testing before a part even exists in solid form," says Ventress. "The software lets us do motion studies and stress analyses, and even generate photorealistic images customers can use for preliminary marketing. It lets us do multiple iterations as quickly as the computer can render them."

Next comes a solid model, typically using stereolithography (SLA), which takes between an hour and a day. These models, made directly from 3D CAD designs using laser-cured resin, accurately reflect the shape and size of a part but are rarely suitable for functional testing.

"We need to know exactly how a part will perform, how it will handle stresses, shocks, and vibration," Ventress says. "We have to predict response to heat, cold, and electromagnetism. For example, we recently developed a plastic case for a device containing lots of tightly-packed equipment. We faced a significant thermal challenge, since there was no room for a fan or other heat-dissipating device, and the device was designed for use in environments with significant heat and humidity, so the material had to handle both external and internally-generated heat. Protomold gave us prototypes that look like the real thing and function like it as well."

Real Parts Real Fast

"The resin in SLA prototypes isn't suitable for thermal, electrical, or mechanical analysis," Ventress says. "But Protomold makes injection molded parts in the same resin we specify for production, making them ideal for testing. Protomold's in-house stock of resins means we get real parts in days. The only other source of 'real' parts would be traditional injection molding, which takes weeks or months and costs many times what Protomold charges."

Ventress considers speedy prototyping critical for reasons besides speed to market. Functional prototypes let developers get feedback from users and suppliers that can inform the development process. "We can address issues without waiting until the end of the process," he says. "With Protomold, we get a faster product and a better product as well."

Quick, Comprehensive Quotes

Ventress also likes ProtoQuote®, Protomold's automated online quoting system. "Waiting for pricing can slow you down as much as waiting for parts can. ProtoQuotes are typically back in a day with all the information we need. They'll even point out any design or moldability issues, so you can address them before proceeding."

ProtoQuote's real-time interaction updates pricing online, as the user adjusts factors like resin, finish, and delivery time. When the order is confirmed, information from ProtoQuote can be fed directly to Protomold's automated milling equipment to begin mold making.

Prepping for Production

Ventress often uses Protomold for bridge tooling as well, while final hard tooling is being developed. "You can get tooling from China fairly quickly," he says, "but not as quickly as from Protomold. We work with Chinese production companies, but it's not simple. There are

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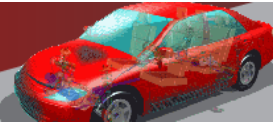
"It's far easier to adjust a design in prototype than in production. Protomold's quick turnaround lets us tweak the design as many times as necessary without overrunning deadlines. When we send a design to production, we know it works, it's moldable, and the kinks have been worked out."

Teaming up with Protomold has helped make designunlimited successful. "Anyone can get you what you need when time is not an issue," says Ventress. "Protomold does it when every minute counts. We do many kinds of work, and every customer gets our best, but when a project lets us work with Protomold, we know it's going to be a good experience."

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