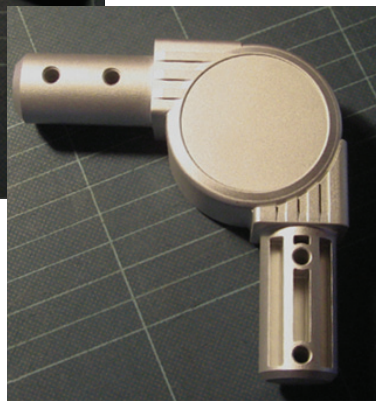
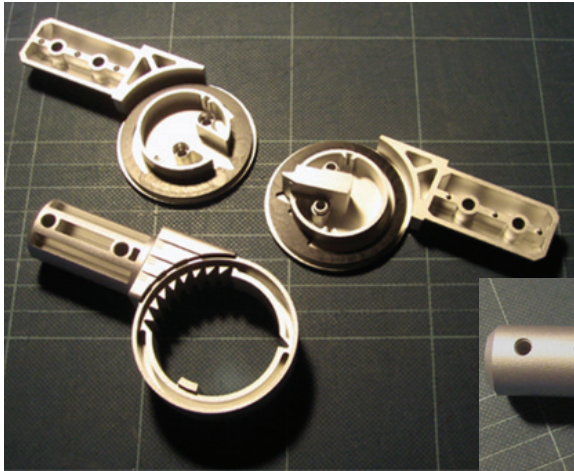


# Kroll Associates Uses Proto Labs

A to Z



In over 20 years in industrial design, David Kroll, principal of Kroll Associates, has always been quick to incorporate new tools and capabilities into his development process. After starting out with “traditional” methods—hand drawing, and hand-crafted and machined models—he readily adopted 2D and then 3D CAD as those technologies became available. Similarly, he was quick to recognize the potential of services offered by Proto Labs (then known as Protomold), first in injection molding and later in automated CNC machining.

“I was curious about the company’s claims,” Kroll says. “I had been seeing their ads for some time and was intrigued with the idea of using the sort of fast, virtual process they were talking about, but I had no real opportunity to utilize their services until just two years ago.” That opportunity arose when Kroll was working on development of a hand-held communications device designed for use by SWAT teams.

The plastic enclosure, consisting of three separate parts, was, according to Kroll, “a tricky assembly.” “We were on a tight schedule, and I needed to verify fit and function at the same time that we were proving out the electronic packaging,” he says. “We were looking hard at every aspect of the enclosure design: the sculpted external surface, component alignments, internal bosses, the keyboard interface, and a snap-fit latching battery door. Normally I might have used stereolithography at that stage of prototyping, but this project required a more robust prototype than SLA would have given us. It was a very fast-paced program, and we needed parts that could be used both for functional testing and to present to our client’s prospective customers at trade shows. Proto Labs, with both Protomold injection molding and their newly introduced First Cut CNC machining capability, looked like the ideal solution.”

Working with a Proto Labs customer service rep, Kroll went to Proto Labs’ new First Cut customer portal, then in beta test. There, he got an automated quote and ordered one set of three machined prototype parts. “I was floored by the results,” he says. “We were hoping for a fit tolerance of .010, and the parts were well within that. The quality was excellent; the machined parts could have been mistaken for injection molded. That settled any doubts we may have had, and we went right back to the First Cut website and ordered five more sets of machined parts. We were pleasantly surprised to have parts in just two days. The new parts were just as good as the

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first ones had been, and we loaded the enclosures up with batteries, electronics, and membrane keyboards, packed them into demo kits, and sent them off to be shown to customers.”

The purpose of functional and market testing was to see whether further development would be required, and Kroll and his client got exactly the sort of feedback they were looking for. “Overall, the devices were very well received,”



Kroll says, “but based on our client’s testing and customer response we decided to make a few additional changes to the product. We moved a few internal bosses in the enclosure, repositioned a few of its internal walls, and expanded the case slightly to accommodate new, larger batteries. One more set of machined prototypes from First Cut confirmed that we had a finished product that met both our client’s expectations and their customers’ needs. With that assurance we moved on to production.”

Kroll submitted a 3D CAD model with the approved geometry to the online quoting engine of Proto Labs’ Protomold service. As is often the case, design requirements for injection molding were slightly different than those for CNC machining, and Protomold’s automated system suggested several minor design optimizations including changes in wall thickness and draft. Kroll compared Protomold’s quote to two others he received. One could not meet the desired turnaround time; the other couldn’t match Protomold’s price quote.

“As with First Cut, we were very impressed with what Protomold could provide,” says Kroll. “I spoke briefly with our Account Manager to confirm their ability to mold parts to the tolerances we required. At that point, I was confident in their ability to meet our needs and we placed the order. The parts were finished within seven days and shipped directly to my client’s facility where they were assembled

into a finished product. Molded in a blend of ABS and polycarbonate, the parts were structurally sound with fit, finish, and texture that were everything we could have hoped for.”

“What was most astounding was the speed with which everything was handled. The time from our first order of machined prototypes from First Cut to final delivery of

production parts from Protomold was just 30 days. I’ve worked on time-sensitive projects before, but I’ve never seen anything deployed this quickly. Without Proto Labs, this aspect of the project could easily have taken six to eight weeks. And that would have been working exclusively with trusted domestic suppliers; I could not consider looking for offshore quotes due to the security-based nature of the product.”

As product rollout has progressed, Kroll’s client has continued to order production parts directly from Proto Labs, while Kroll has moved on to other projects. Most recently, taking advantage of the First Cut prototype division’s newest service, he has ordered parts machined in aluminum. According to Mark Kubicek, Executive Vice President of Proto Labs, aluminum was added to the long list of available materials in January 2009. “It wasn’t really a transition,” says Kubicek. “The software that automates the process is the same, and with appropriate milling equipment, aluminum is just another material to machine.”

Kroll’s new project involved development of a robotic arm. “I wasn’t aware that First Cut was

producing parts in aluminum,” he says. “We were working on a ratcheting elbow for the arm and I had used First Cut for some machined plastic prototypes. As the project evolved and the demands on the part increased, I went back to get a quote for parts in a high-strength plastic resin. Looking through the materials list, I was elated to see aluminum as an option. I plugged in the model, got a quote and ordered five pieces for validation. The prototypes turned out to be just what we needed.”

“Once the design was validated, we proceeded to have aluminum production parts die cast, but it was First Cut’s aluminum prototypes that gave us the confidence to go ahead with production. With three-day turnaround on the prototypes, their machined prototypes are a proven way to be sure things will work before committing to the cost of production.”

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“I’ve never been able to get prototype parts made this quickly or this well. What Proto Labs is doing is definitely revolutionary and it’s giving me a distinct competitive edge in my business. I’m especially pleased that an American company is leading the way in this technology. If I had to think of one thing I’d like to see changed at Proto Labs, it would be the maximum size of parts they can make. I recently designed a 42-inch long sculptural tool handle that was too large for their process, but over the years I’ve seen a steady flow of new features, capabilities and size capacity at Proto Labs, so I’ll keep watching.”