

## **Roland MDX Case Study – Questa Design LTD.**

### *Unlimited Options for Rapid Prototyping and Rapid Manufacturing*

Aki Hirano loves a challenge, and each day at Questa Design Limited provides a new one. Questa is a design, engineering and manufacturing firm in Scarborough, Canada, that specializes in high tech, product design and development along with low- to mid-production manufacturing. In the 1970s, they manufactured geophysical instruments for the exploration of Canada's vast mineral resources. With changing times came changing needs, and although the company still manufactures scientific instrumentation, they also design and produce everything from heat sinks to broadcast video assemblies.



"We do work for a lot of engineers, scientists and other professionals, people who are careful by nature and who depend on our designs to perform for them in the field or the laboratory," Hirano, vice president of Questa, said. "For our firm, rapid prototyping is really rapid manufacturing or digital product manufacturing (DPM), since our clients expect the prototype to function exactly as the finished product would."

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Questa operates at the forefront of DPM and each step in their manufacturing process makes maximum use of the initial design data, thereby drastically reducing the need for manual input or user intervention. "What sets us apart is our ability to efficiently handle the entire product development cycle," said Hirano. "Most other companies in Canada specialize in either design or manufacturing. We do all of that and more."

To manufacture prototypes that meet their clients' aesthetic and mechanical requirements, Questa relies on their Roland MDX-540SA milling machine. They use the MDX to produce prototypes with the same tolerances, surface finish and materials as production volume parts.

Questa values the MDX-540SA's versatility, noting that no other rapid prototyping process allows them to use such a wide variety of production materials, including ABS, polypropylene, and aluminum. "Other machines can handle some thermoplastics, but none have the range of the Roland," said Hirano. "With the MDX, we can run the exact material that will be used in the final product."

They also appreciate the MDX's easy operational set up, noting that Roland's SRP Player CAM software quickly creates tool paths and the optional fourth axis makes fixturing easier. "The MDX offers us a cost-effective way to try out design alternatives before we present our ideas to our clients," said Hirano.

Questa's client list includes companies in the medical, broadcast, automotive, and consumer electronics industries. They have even designed camera parts and consoles for a company that produces remote broadcast systems that can be used in conflict zones. The robotic camera and console unit allows a correspondent to produce a live shot broadcast without a camera operator, and send it out via the Internet. Another client produces speakers using enclosures prototyped by Questa, while a third had Questa design a boarding system for less-abled motor coach passengers.

Questa also produces its own products, such as their innovative skate guard "kootsuTM." kootsuTM was originally designed and modeled on the computer, then run as a prototype in FDM ABS. After checking geometries to ensure the prototyped parts fit together correctly, Questa then produced a model on the MDX using polypropylene, a common injection molding plastic. When physical testing revealed that polypropylene was too hard and slippery for practical application, Questa ran another model in low-density polyethylene, a softer grade of plastic, which tested successfully. "The Roland allowed us to test multiple materials quickly and easily," said Hirano.

In the current economy, Questa finds its prototyping business shifting from single runs to short production runs. "Fortunately, the MDX can handle both types of runs," said Hirano. Questa also uses the MDX to produce additional parts clients occasionally request, saving set up time on larger production machinery. "With the MDX, there's no post-processing, and no finishing on plastics," said Hirano. "It comes off the machine and goes right to the client."

"It's always hard for me to answer people who ask what we do," said Hirano. "Every project is different, and versatility is critical for our business model. The MDX's range of applications, from prototyping to finished products, really helps us meet the challenges we face every day."

