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## Finding Success with Special Machinery

*Market Profile*

When National Tooling & Machining Association member Process Equipment Co. (PECo) developed the capacitor discharge welding (CDW) machine, company managers thought they would take the welding world by storm.

The technology had been around since the 1950s for small workpieces, but Tipp City, Ohio-based Process Equipment ([www.peco-us.com](http://www.peco-us.com)) helped develop a machine that would allow the joining of larger parts—faster and cheaper than, and a potential replacement for, legacy resistance spot-welding systems throughout industry.

CDW is a solid-state welding process that welds by forging action rather than fusion or melting the materials together. In CDW, one piece is pressed into another with high force, with tens of thousands of pounds per square inch. Then a single electrical pulse is sent through the joint, which is heated to red-hot-but not melting-temperature. The pulse together with the forging force gives an extremely high-quality solid-state joint, and is up to five times less expensive than many conventional welding operations.

"We thought we would conquer the world with this thing," says company President Michael van Haaren. "That's what our market research said. Many times you can do the market research and attempt to measure people's needs, but it's very hard to measure their willingness to change."

This lesson is by no means isolated in the special machines business, where gauging market needs and wants can be as much of an art as it is a science. For PECo, the road in the special-machines market has seen tremendous successes, as well as a few failures. It's



Capacitor discharge welding technology from PeCo.

a business where many things don't turn out as planned, that CDW business included. Introduced in the United States in the 1990s, it still remains a money-maker for the company, but van Haaren admits the company had unrealistic expectations. Still, today it represents a profitable, albeit a smaller-than-predicted, niche of the business.

Why? Well for one, engineers in industry know the conventional welding processes, from resistance spot welding to various arc welding processes. Learning and retrofitting a manufacturing process to a new joining method takes what van Haaren calls a "paradigm shift on the manufacturing floor," and those often don't happen easily.

The 180-employee company, like most, has humble beginnings, launching as a small machine shop in 1946. The firm today has grown into four divisions operating in a total of 190,000 square feet of space. One division handles large fabrication, machining, grinding and finishing applications for large components. Another focuses on production welding products, including laser and CDW technologies. The third focuses on robotic accessories, specializing in end effectors and grippers, and the fourth offers metrology systems to manufacturers.

Through the years, the company has developed machinery and accessories in various ways. Often, it comes through serendipity. For instance, its robotic end-effector business came about through in-house development for the company's own manufacturing operations. "Once we used them here, we thought others could use them as well," he says.

At the other extreme, the company's gear-inspection line got its start with managers identifying a need and making an investment to enter the market with an operator-friendly, Windows-based inspection device.

Both of these launches have evolved into successful businesses. But this hasn't held true for every product.

Consider one product first developed for the military. "The machine would measure the interface properties of fiber-reinforced ceramics," van Haaren says, "the material used in some very hot areas, like the exhaust cones in military aircraft."

With the product developed, the company sent out market surveys to see if this product would fit a need in a wider market. The survey responses gave a very positive response. "We thought we would be selling 20 to 30 of these a year," he says. This didn't happen in part because the company did not ask one question on the survey: How much would you be willing to pay for the technology? "We sold three in seven years-not exactly a success," he says.

In the coming years, says van Haaren, the company's customer base may change, but its mission will remain the same: develop cost-effective equipment that solves industrial problems. He says the company's automotive customer base will likely shrink. As the likes of Honda and Toyota gain more market share, the sector's demand for specialized equipment will likely decline. (Toyota, for instance, tends to do much of its process development in Japan. Though more parts for U.S. plants are being sourced locally, most specialized process equipment for these plants comes from Japan.)

One thing's for sure: PECo will become more global. Today its welding systems and gear-inspection businesses are already firmly rooted in the global market, selling to both Asia and Europe. Within the next decade, van Haaren sees that trend continuing.

He adds that success and failure developing specialized machinery depend on myriad factors. The key for success is innovation. Some projects will work, others won't, despite what market research may say. But as long as the innovation continues, he says, PECo's success will most likely continue with it.

For More Information

National Tooling and Machining

Association (NTMA)

(800) 248-6862 • Fax: (301) 248-7104