

Focus on Fuel Cells

An Interview with Eric Jensen,
Manager-New Technology, Research and Development, Crown Equipment Corporation

EDITORS' NOTE Before joining Crown in 2006, Eric Jensen was a staff engineer with Delphi Automotive in the area of advanced chassis controls systems. Before this, he was a senior project engineer with General Motors. Jensen has been granted 22 U.S. patents, with 17 pending. He graduated from the University of Dayton, with both a Bachelor of Science in mechanical engineering and a Master of Science in mechanical engineering.



Eric Jensen

COMPANY BRIEF Headquartered in New Bremen, Ohio, Crown Equipment Corporation (www.crown.com) is one of the world's largest lift truck manufacturers, and provides users with safe, efficient, and ergonomic electric lift trucks that lower total cost of ownership and maximize uptime. The company's lift trucks are used in transporting materials and goods in warehouses, distribution centers, and manufacturing environments and are sold throughout the world. Crown has received a number of awards and recognitions for its sustainability efforts, and has extensive global manufacturing capabilities with plants in the United States, Germany, Australia, Mexico, and China.

Would you give a brief overview of Crown Equipment and the key areas of focus for the company?

We're a world leader in material handling equipment, a business we have been in for 60 years. We design and build a wide variety of machines to solve our customers' needs to move material around a warehouse. We're known worldwide as an electric forklift company, although in November 2009, we introduced an LP (liquid propane)-powered, internal combustion engine truck, which is a first for Crown. It's a strong, clean-burning piece of equipment with a John Deere industrial engine.

Crown has taken a leadership role in the fuel cell industry, both in Ohio and outside the state. Why have you pursued that focus for the company?

We've been involved in the fuel cell industry in material handling since at least 2003. Our customers started to have an interest in the technology as a way of getting greater productivity out of their machines and as a way to eliminate batteries from their facilities. We're walking into

the future with our customers as the supplier of these fuel cell products. We have brought these products into early commercial development, as our customers have gotten to the point where they're comfortable with the durability, quality, and power of the product to sell it into the market space. We've had active relationships with all of the major fuel cell power pack providers for the material handling industry.

Is there an effective understanding of the capabilities and value of fuel cells?

There is still a lack of knowledge in the marketplace, and some skepticism. A lot of our customers have done truck trials and they're seeing the benefits of using this technology for their particular application. There are applications that are much better for fuel cells than others, and the industry as a whole is somewhat conservative. They want to see the proof first. Some of the larger companies are providing it themselves. They're breaking that ice and moving forward, and some medium-sized companies are starting to gain an interest in it as well. We're doing our best to share information on our experiences and where these products have a really strong application and where they might not be so great.

Is appropriate funding being applied to research and development in this area?

Ohio is a fantastic place to be in the fuel cell business. Ohioans have created the Third Frontier program, which is a grant funding initiative through the state that funds high-technology projects – things like fuel cells, nanotechnology, advanced batteries, and advanced solar cells. They've offered up grants to help boost these technologies in Ohio and then to spread that technology through the U.S. and the rest of the world, with Ohio being a central hub – we call it the Hydrogen Highway.

There is an Ohio fuel cell consortium that brings together fuel cell suppliers to help promote the development of fuel cells, and as part of that, Crown has asked for and received two different grants totalling nearly \$2 million for fuel cell research.

The first grant allowed us to set up a fuel cell project center to specifically work with the fuel cell vendors to qualify their product for use in our trucks. We have certain specifications that we have to meet for OSHA compliance and the

fuel cell manufacturers have worked to make their product a direct replacement for the lead-acid battery. We also qualify our trucks to make sure that they operate just as safely and to the specification exactly as we designed them and to make sure that is not compromised by the fuel cell.

The fuel cell vendors, in turn, have worked with us and we have helped them build their technology to make it more robust, and we have learned from them the different techniques required to make it work even better in our trucks.

Many are surprised to learn that Ohio has been an innovator in renewable energy. To what do you attribute that?

The Third Frontier was recently put on the ballot for renewal and it passed overwhelmingly in the State of Ohio. So the Ohio voters understand the value that a program like the Third Frontier brings to their state.

We're doing everything to spread the word that Ohio is a great place to do business if you're in the alternative energy world, and as such, we make material handling equipment that initially was battery-powered, and now is also LP-gas powered, and is increasingly becoming hydrogen powered with fuel cells. We want to offer the best technology for the application.

As a global company headquartered in Ohio, have you been able to find the talent within the state to develop the technology, and are the state's universities adequately training those future leaders?

Ohio's universities are doing a fine job of creating the new high-tech worker. We haven't had too much difficulty in finding the kind of people we need to develop our program. We have a great work ethic in the state of Ohio, and if we don't understand something, we'll go out and learn about it.

As you look at how technology has developed in regard to advanced energy, do you find employees are excited about the transition into these areas for the company?

Engineers are a pretty inquisitive bunch, so they're always looking for something new and interesting to work with.

We're a farm culture and we don't waste anything, so we don't want to waste any energy either. Folks here understand energy conservation, so we're striving to use the technology that we have at our fingertips, or that we're creating every day, to make a stronger product that uses less energy. ●