

## It's A Green World After All *Workhorse Gets Green Makeover*

by *Brian Schiavo*

Lift truck manufacturers have not been immune to the "green" trend. In fact, companies such as Raymond, Crown, Hyster and Yale are finding new ways to reduce the impact that their manufacturing processes and their equipment has on the environment.

"We have a long history of environmental efforts and sustainability," says Brian Duffy environmental and safety manager for Crown Equipment Corp., New Bremen, OH. Crown manufactures a large percentage of the components that go into its lift trucks. This gives the company a distinct advantage in what happens during the manufacturing process, allowing it to apply its own environmental principles, down to the component level. "Each component has an environmental strategy associated with it," he says. "In our mast plant, for example, we do welding and plating. Our component level strategy for that was to put together a zero discharge plating operation." This means the process generates no hazardous waste sludge.

Even the rinse waters used during plating are re-cycled, making it a completely environmentally sound operation.

Crown was recently awarded an Achievement Award from the National Partnership for Environmental Priorities for one of the changes it made in its production processes. This one entailed switching from a liquid coating painting process for its power units and most parts to a powder coating process. The process eliminates all VOC (volatile organic chemical) emissions. The switch eliminated more than 65 percent of the wastewater generated by the old process and saves more than 200,000 pounds of water and sludge.

### **On The Horizon: Hydrogen Fuel Cells**

Another trend that has been gathering an incredible amount of steam in the past few years is the utilization of hydrogen fuel cells to power lift trucks. Many of the major manufacturers are testing the viability of this alternative

power system.

Cellex Power Products Inc., Vancouver, BC, is a supplier of fuel cell power solutions for electric lift trucks. Last year, the company concluded a successful beta trial in conjunction with Crown, at a Wal-Mart food distribution center in Ohio. It is now moving, along with its parent company Power Plug of Latham, NY, into an early commercial phase of the plan.

"We will begin to ship these units starting in the fourth quarter of the year," says Tom Hoying, vice president of sales and marketing for Cellex. "We're in the final throes of preparing 100 Class Three units for customers right now. After the second quarter of next year we will start putting beta units out in Class One and Class Two stand up-units."

Reasons for switching from lead/acid batteries range from the environmental-old batteries leak acid and lead into landfills-to issues of productivity.

“There’s no battery droop,” says Hoying. “Any lead battery, once it reaches 60 percent of its available energy, starts to drop off faster, which means the truck tends to run slow. Fuel cells run longer.”

In addition, the downtime for lead/acid batteries is incredibly long, necessitating removal of the battery from the truck, as well as a protracted recharge time and a cool-down period before they can be utilized. In contrast, fuel cells can be filled with compressed hydrogen from a filling station—a process that takes minutes.

Raymond Corp., Greene, NY, is on the forefront of the research. “We realized, as a truck manufacturer, that we needed to understand not only the environmental and productivity issues, but also the technological ones,” says Steve Medwin, manager of advance research for Raymond. “In the fall of last year we were awarded a large contract from New York State that partially funded our internal program.”

As part of the program, Raymond installed outdoor hydrogen storage and compression as well as an indoor refueling area in their production factory. Fuel cells have been installed in a Class Three pallet truck, a Class Two reach truck and will soon be installed in a Class

One stand up truck as well as another reach truck. The company is using the trucks in its manufacturing process.

“All of these systems are hybrid,” he explains. “They have a fuel cell and they also have another way to store electricity.” Raymond uses super capacitors for this function. “Hybridization is really key to the performance of the truck,” Medwin says. “When you’re lifting a load 40 feet in the air, you need a burst of energy.” Supercapacitors provide this extra energy for them.

“Currently, we are evaluating the technology,” he adds. “We’re using our factory as a living lab.” The duration of the experiment will be two years, after which Raymond will evaluate the evidence and determine what role they should play in the supply chain.

## **Anti-Corrosion Trucks For Tough Environments**

**A few lift truck companies have begun to offer anti-corrosion packages for their trucks, which makes for more environmentally friendly, cheaper to maintain trucks. Yale Materials Handling Corp., Greenville, NC, offers a galvanization process for its MPW-050-W walkie truck. This helps protect**

**the vehicle’s surface in harsh environments, thereby reducing the number of times the truck needs to be painted. It also reduces the overall maintenance costs during the life of the truck.**

Hyster, Greenville, NC, provides an Extreme Corrosion/Wash Down Package on selected versions of its pallet trucks that provides extra protection for trucks working in applications that require they be washed-down frequently, or in situations where they are exposed to corrosive forces.

## **Raymond’s Fuel Cell ‘Living Lab’**

Raymond Corp.’s Greene, NY, manufacturing facility has become a “living lab” with hydrogen fuel cell-powered Raymond forklifts in the facility.

The goal of the program is to study the performance of hydrogen fuel in electric forklifts and to demonstrate the safety of a hydrogen-fueled forklift environment.

In a conventional lift truck, the energy used to drive the truck is stored as electricity in a lead-acid battery. In a fuel cell, energy is stored as hydrogen gas and converted into electricity as needed.

According to Raymond, there appears to be significant

potential to improve warehouse productivity and lower operating costs if fuel cells are used in high-throughput warehouse operations.

Hydrogen fuel cells offer higher productivity because they can be rapidly refueled-in several minutes vs. several hours-eliminating the need to change a battery.

Cost savings come from eliminating the need to buy batteries and chargers and from labor savings. Another advantage is that the voltage delivered by a fuel cell remains constant; the vehicle experienced no performance degradation until the fuel runs out.

Furthermore, hydrogen is environmentally clean: the only by-products from a fuel cell are water and heat.