

Keep on Truckin’

North America’s largest electric lift manufacturer saves nearly 50 percent in material costs with a successful conversion from liquid to powder coating.

For nearly 90 years, The Raymond Corporation has been an innovator in the North American materials handling industry. Their success can be attributed not only to innovative products – like the first hydraulic hand lift truck in 1934 and the first narrow aisle truck in 1951 – but also to their ongoing mission to improve their customers’ operations.

So, when it came time to analyze and upgrade the efficiency of its own finishing process, The Raymond Corporation, an integral member of the Toyota Materials Handling Group, knew that only the best would do. True to their commitment to innovation and expertise, Raymond turned to Nordson Corporation to provide a powder coating system that would provide high-quality performance and the experience to back it.

“Our volume was increasing and we needed to find a solid finishing system to support our production goals,” explains Jim Jackson, manufacturing engineer at The Raymond Corporation. “Originally, we were set on another liquid system, but months of due diligence revealed a better solution. Our paint team evaluated at least 10 options before settling on powder coating and Nordson.”



Prior to working with Nordson, Raymond used an air-dry liquid paint system with conventional conveyors, a two-stage washer and liquid spray equipment. Even though the finished product had a tough durable paint, the system had several issues. The biggest concern was the time it took the paint to air dry. After painting, the parts cured on a cart and were susceptible to finish damage during cure time. Once parts were dry to the touch, but not fully cured, they made their way to the assembly operation where they were further subject to finish damage. This led to increased cost due to the many handling precautions required and significant amount of rework.

According to Jackson and Jim Kadlec, manufacturing engineer, the company set several goals for its new powder coating system: increase production capacity, lower coating cycle times, reduce rework and improve the product finish quality.

“Nordson’s powder coating system promised to achieve all these goals and one more,” says Kadlec. “Powder coating helps us decrease our environmental footprint by increasing transfer efficiency, reclaiming powder and eliminating hazardous air pollutants in our formulation.”



A large undertaking

Raymond's operation requires that they coat very large parts. The part window for the system is 6-feet wide by 6-feet tall by 16-feet long. What's more, with considerable mass (such as with 4-inch-square, heavy gauge steel tubing used for outriggers and very heavy counterbalance weights), Raymond needed the best available technology for their particular operation. In addition, 80 percent of its production is coated black, with 20 percent a mix of red and orange.

Evaluating these specifications, Nordson recommended a two-booth powder coating. The first booth is a Nordson Excel® 3000 cartridge powder coating booth outfitted with Sure Coat® automatic guns for the black powder; and the other contains two Prodigy® HDLV® (high-density powder, low-velocity air) manual spray guns for red and orange powder.

Other powder coating operation components include a five-stage washer/pretreatment system, environmental room, power-and-free conveyor system and a five-lane convection oven.

"This was a very challenging project with respect to available floor space and the curing of the extreme range of part thicknesses. We spent a lot of time in our customer lab getting it right," explains Mark Horton, regional sales manager for George Koch & Sons, the system house that coordinated all the finishing components. "Reaching part-to-part consistency was the real challenge because there were varying thicknesses in the metal components. But, Raymond is a stickler when it comes to quality and there was no compromising." Three rounds of testing at the Koch facility with different powder formulations from Valspar was imperative to a successful implementation. In addition, the project also included the powder coating of a complete lift truck for testing at the customer's facility.

New system...major improvements

Used to apply the black powder, Nordson Sure Coat automatic guns provide Raymond with an efficient, versatile and operator-friendly application tool. Sure Coat guns are recognized industry-wide for superior coating coverage and a design that lends itself to fast, easy cleaning without gun disassembly for reduced downtime.



Transfer efficiency is maximized in the system with Nordson HDLV technology. This includes a dense-phase pump and two Prodigy manual spray guns, which are used for reinforcement in some of the tougher-to-reach recesses and tight corners. Nordson HDLV technology moves more powder with less air and higher transfer efficiency than conventional venturi-style pumps. This results in a softer spray, larger fan pattern, even pattern distribution, and less powder consumption.

"We're saving about 50 percent in material costs over what we spent in liquid paint for the same amount of trucks," explains Kadlec.

Other benefits of the new system include:

- Cleaner parts with the five-stage washer compared to the old two-stage system
- A 40 percent reduction in load bar cycle times
- The ability to produce about 9,000 trucks per year in a single shift operation versus about 7,500 in a two-shift operation
- A 100-percent cured finish on part components when they come out of the oven
- More durable finish over liquid coating
- Reduction in waste

Another significant improvement is the reduction of labor and WIP Raymond has eliminated by implementing a new two-tone process for their tractor bodies. Kadlec has led a team to create a process in which both the red and black can be sprayed in the booth at the same time. When the truck leaves the powder system, both red and black are 100% cured in one cure cycle and ready for the assembly line.

But Jackson and Kadlec both agree – the single greatest benefit of their new powder coating system is the uniform finish they are achieving "The finish we're getting now is so consistent and durable that we actually eliminated the whole touch-up process. And rework labor has been almost eliminated completely," says Jackson.