

## Grounded in Savings

*Plural component coating system, including improved electrostatic applicators, slashes downtime, and paint and solvent usage in the application of a rust inhibitor coating.*



Robot rotary atomizers apply rust-inhibiting, two-component coating to the vehicle framework in spray booth two.

Super duty trucks demand durable coatings to inhibit corrosion and rust, and plural component coatings fit the bill. These materials require a two-component metering system that delivers reliability, accurate ratio mixing, low maintenance and minimal downtime. An ideal solution for one manufacturer serving the automotive industry was the Nordson OptiMix™ 1 plural component liquid metering



OptiMix® 1 plural component mixing system.

system, used in conjunction with the Trilogy® manual electrostatic spray gun.

“Ground Effects, LLC, based in Windsor, Ontario, Canada and ([www.gfxltd.com](http://www.gfxltd.com)) founded in 1986, is a supplier of interior and exterior accessories to the automotive industry. The company produces a wide range of automotive parts and offers mass vehicle customization and surface coating services, such as e-coat and powder coatings, hydra graphics and polyurea spray coating.

In order to serve a key customer, Ground Effects opened a new facility in Westlake, Ohio, USA, in January 2015. The customer relies on Ground Effects to apply a specialized rust inhibiting coating to super duty vehicles and related parts.

The facility houses two robotic coating lines and one manual coating line. Initially, when the company installed its first plural component system on all three of its coating lines, things got off to a rocky start.

The rust-inhibiting coating material is a 5:1 ratio resin to catalyst mix. The catalyst, which accelerates curing time, is quite aggressive and causes the mixed

material to have a very short, 15-minute pot life. As a result, Ground Effects had two major requirements of its coating system.:

- **First**, the system must deliver and apply the material quickly and efficiently to prevent premature curing.
- **Second**, in order to meet and exceed EPA requirements, the system must use a minimal amount of purging solvent due to frequent system flushes.

### Rough Road Behind

Unfortunately, the original metering system met neither of Ground Effects' requirements.

According to the team at Westlake Ground Effects, the group went for months fighting material buildup, the mixing manifold getting plugged, application guns getting clogged and seals breaking – and all taking place on a brand new coating line. According to team members, they were replacing plugged mixing manifolds every other day. They would tear the manifold down completely, put in new parts from a rebuild kit and also have to replace the clogged fluid lines.

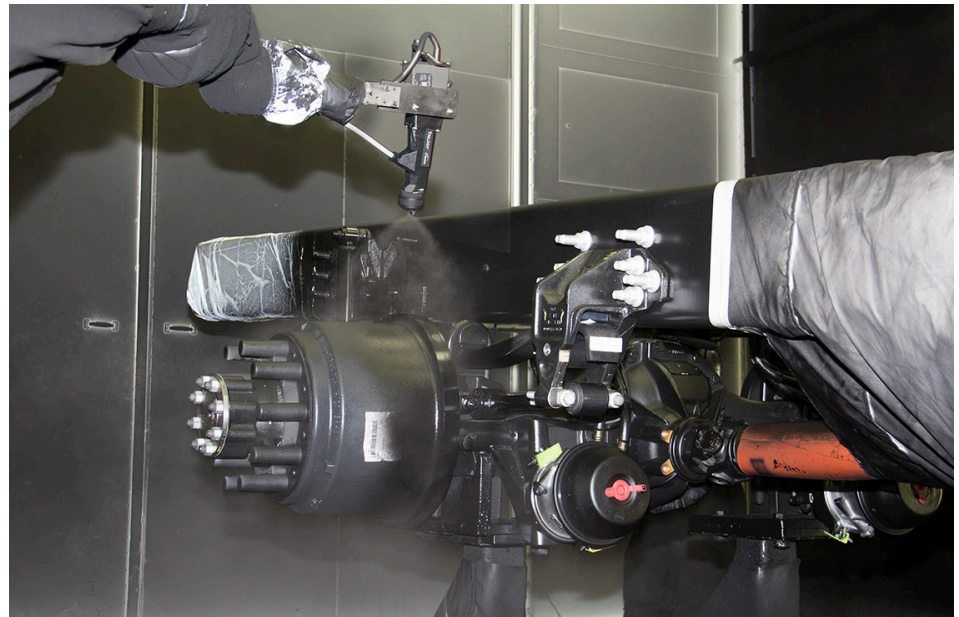
Transfer efficiency with their turbine powered electrostatic spray guns was also not what was expected. The air atomized electrostatic guns were powered by a turbine that required about 45 psi to atomize the paint and generate the electrostatic charge. This created excessive paint waste and booth maintenance resulting from too much bounceback in corners and recessed areas of the part.

Between coating material waste, spare parts usage, production down time and labor, it cost Westlake Ground Effects an average of \$400 to \$500 each time the system failed. Although the system was new, it cost the company more than \$52,000 in downtime and parts in less than a year.

Frustrated with the system performance, the team realized that there had to be a better system solution available.

#### Subhead: Getting it in Gear

One of the Ground Effects team members had a very positive experience with Nordson electrostatic air spray equipment earlier in his career. Based on past positive experiences, Ground Effects contacted Nordson Industrial Coatings



**Trilogy® automatic electrostatic spray gun applies two-component coating in spray booth three.**

in Amherst, Ohio, to see if they offered a better solution.

Nordson's Liquid Systems specialist Rob Schwamberger visited the Ground Effects facility. After reviewing and studying the coating process, listening to the operators' and the company's needs, Schwamberger had a complete understanding of the issues Ground Effects was experiencing with the existing plural component coating system and electro-

static spray guns. A complete revamp of the spray painting processes in the facility was offered.

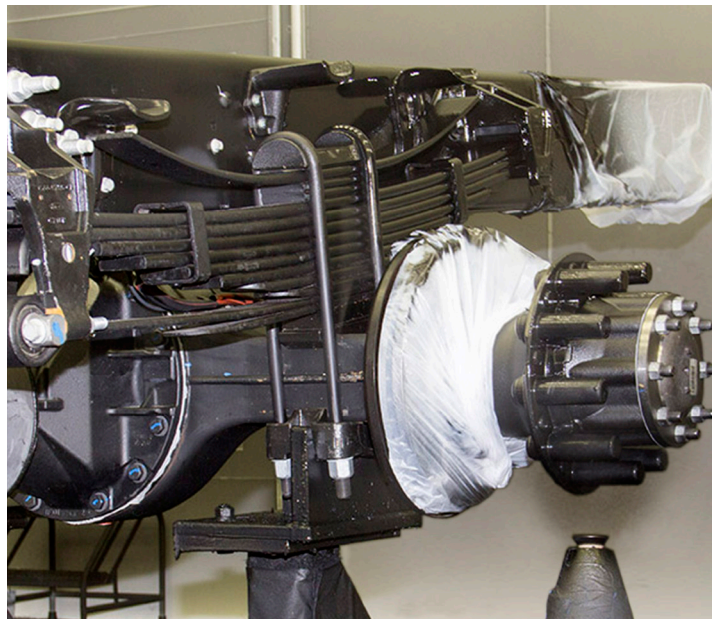
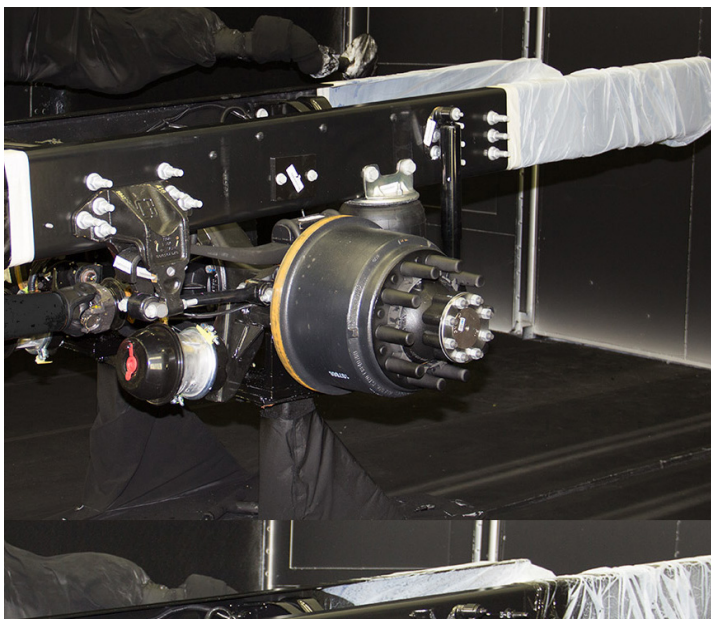
Schwamberger recommended that Ground Effects give the Nordson OptiMix 1 plural component system and Trilogy® air atomized electrostatic spray gun a one-month, no-charge demonstration-trial as the first step of the process.

The OptiMix 1 system provides electronically controlled proportioning and mixing of solvent-based and water-based coatings for use in airless, air-assist airless, air spray, HVLP, LVLP, electrostatic and rotary atomization spraying. The system uses dynamic dosing to achieve complete material mixing and easily handles mix ratios ranging from 0.5:1 to 50:1, making it suitable for most painting and coating applications. In addition, up to 10 controllable base material and catalyst material valves allow the system to manage 10 individual recipes. Users can easily change material chemistries and colors with the push of a button. An audible alarm also alerts users to incorrect material ratio or end of material pot life situations.



**Trilogy® automatic electrostatic spray gun applies two-component coating in spray booth three.**





Robot rotary atomizers apply rust-inhibiting, two-component coating to hub assembly in spray booth two.

The Trilogy electrostatic spray gun is available in an air spray or HVLP configuration. A 93KV power supply generates the higher tip voltages, during the spray process, that are required to improve transfer efficiency and coverage. The power supply can be switched between kilovolt mode and AFC (Automatic Feedback Current) with the push of a button. The AFC mode improves penetration into recesses and Faraday cage areas.

“After the one-month trial, we all agreed that the Nordson spray guns provided better coverage on bolt threads and recesses, while reducing paint usage by more than 20% versus the old turbine style, electrostatic guns,” Schwamberger explains.

The manual spray line at Ground Effects is used to coat hubs, engine components, brackets and cast parts used in super duty trucks. The parts range from  $\frac{3}{4}$  inch (19 mm) to 12 inches (305 mm) in size.

The corrosion inhibitor coating process begins with a visual audit of incoming parts to assure they are not damaged. Parts are loaded onto the paint racks and

wheeled into the spray booth. The use of an electrostatic spray system requires grounding to assure safety. Two painters apply coatings to all racked parts for 20 minutes. Parts receive an initial curing for 9 minutes at 113 degrees Fahrenheit (45 degrees Celsius). Final curing is complete within 24 hours and parts pass crosshatch adhesion testing which assures coating durability. When quality audits are complete, parts are packed and shipped to the customer. The entire process is complete in 24 hours.

Ground Effects uses two OptiMix 1 plural component systems supplying the Trilogy manual electrostatic spray guns in the spray booth for 10 hours each day, four days a week, coating 3,000 parts daily.

### Optimizing System Flushing and Solvent Use

The old system mixed the resin and the catalyst materials in a remote manifold that was dragged across the floor by the painters. The materials travelled by two separate supply lines to a special manifold, followed by a 6-foot (1.8 m) dispensing hose from the

manifold to the spray guns. The mixed materials would begin to harden while in the manifold and in the spray guns.

“That’s where the failure was – you cannot spray coating material when it has hardened and blocked the lines,” says Schwamberger.

By contrast, the Nordson system mixes resin and catalyst in the OptiMix unit right at the spray booth wall and delivers the mixed material via low friction fluid line to the spray gun. The purge process uses a small amount of solvent in conjunction with a large quantity of compressed air to flush the paint line, referred to as air chop.

To minimize the amount of solvent used during flushing, Nordson replaced two individual 50’ (16m) feed lines, one for catalyst and one for resin, and a 6-foot (1.8 m) mixed fluid line with a smaller diameter 35-foot (11 m) mixed fluid line with an integrated, variable, air chop. The air chop introduces compressed air and solvent into the fluid line at the same time, creating a scrubbing action within the system. This process greatly reduces the accumulation of cured coating on the interior of the paint lines.



**Trilogi® automatic electrostatic spray gun applies two-component coating in spray booth three.**

“A huge benefit is that you can change the amount of solvent versus the amount of air – you can have 50-percent air and 50-percent solvent or 70-percent air and 30-percent solvent, depending on the application. It’s all adjustable through the OptiMix 1 program. We’ve cut the flushing time down considerably and the amount of flushing material we use in the line by using more compressed air,” explains Schwamberger.

Using less solvent has benefits in addition to cost savings. “EPA compliance is key, but Ground Effects also values their relationship with the community and the local fire department. Storing and using less solvent is good for everyone,” he adds.

## Super Duty Cost Savings

Since permanently installing the OptiMix 1 plural component system and Trilogi spray guns, Ground Effects has eliminated the maintenance costs and downtime they experienced with the previous, competitive system. They also increased paint transfer efficiency by about 20% versus the old turbine style electrostatic spray guns.

The Ground Effects team does preventative maintenance every-other week, rather than required maintenance every-other day on their previous system. They no longer spend time troubleshooting, experiencing downtime or

buying rebuild kits. With Nordson, they replace the static mixer, every couple of weeks at about \$20 each, instead of \$400 to \$500 of downtime every few days with the old system.

## The Road Ahead

Nordson installed the equipment and stayed at Ground Effects for over a week to work with their paint operators to ensure they understood the system’s capabilities and were comfortable running the system on their own.

The savings have been so substantial in the manual booth that a second booth with two robots has now been converted from the original metering systems and turbine style, electrostatic spray guns to the Nordson OptiMix 1 paint metering system and RA-20R robot mounted rotary atomizers. The RA-20R provides superior atomization. The fine paint particle size, combined with Nordson’s special shaping air kit provides exceptional penetration into recesses and Faraday cage areas. This provides high transfer efficiency and uniform coverage on these difficult to paint parts.

This system has been in production since the beginning of the year and allows Ground Effects to continue enjoying the benefits of Nordson Liquid Systems technology.

**For more information, speak with your Nordson representative or contact your Nordson regional office.**

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LQR-17-6051  
Issued 10/17