Powder Coating System
for Metal Packaging

Green, Sustainable Packaging for Our World

The need for more cost-effective, environmental compliance continues to grow rapidly, driving significant changes to the metal container manufacturing industry.

Nordson Powder Coating Technology is an effective, cost-efficient, environmentally friendly solution for aluminum tube and aerosol monobloc manufacturers who face increasing requirements for reduced solvent emissions.

Using the Nordson Inside-Spray Powder Coating System* to apply durable, approved powder coatings to aluminum tube and one-piece aerosol containers has significant advantages:

- No major modifications required – applies powder to the container in the existing production line, reducing installation and new technology costs.
- Eliminates solventborne VOC emissions from the coating process.
- Optimizes product performance and quality.
- Eliminates incinerator costs for internal coating.
- Eliminates paint disposal costs for internal coating.

*Cans are conveyed to the spray station where powder material is applied with Nordson lancing guns. Virgin powder is first sieved in an ultrasonic vibratory sieve. Then, delivered through the Nordson HDLV® (High-Density powder, Low-Volume air) powder pump from the main hopper to the guns’ feed hopper which is equipped with high and low level sensors.

Throughout the coating application, powder from the gun, as well as overspray, is circulated back to the sieve using proprietary Nordson technology for maximum transfer efficiency.

*Patent Pending
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**Precise Coating Control**
Powder particles receive an electrostatic charge as they exit the spray gun. As a result, they are attracted to the grounded container. Setting kV output provides maximum transfer efficiency.

Nordson Automatic Feedback Current (AFC) lets the operator set maximum current (μA) output from the spray gun to prevent excess charging of sprayed powder. Setting is adjustable in 1 kV increments at the range of 25 to 95 kV. This provides an optimum combination of kV and electrostatic field strength for coating parts with interior corners and deep recesses at close range.

Electrostatic charge is automatically turned on/off during the spray application process for maximum operating safety.

The spray nozzle extension (lance) provides even powder distribution throughout the inside surface of the container wall and bottom. Nordson customizes extensions to meet stringent coating application requirements for containers of varying lengths and diameters.

**Integrated Feed Center**
The powder feed system, located adjacent to the production line, includes a feed hopper, ultrasonic sieve, pumps and controls. Powder is supplied to the feed hopper directly from shipping cartons. The HDLV® (High-Density powder, Low-Volume air) transfer pump draws powder from a mini hopper near the guns. The amount of powder supplied to the mini feed hopper is controlled using level sensors.

A high-efficiency ultrasonic sieve is part of the powder recycling system, accepting both virgin and reclaimed powder.

The sieve uses an ultrasonic screen to separate powder particles by size and reduce contamination of the powder supply. The particles passing through the screen are deposited in the feed hopper, then fluidized and pumped to the spray guns.

The Feed Center features a PLC-based electro/pneumatic controller that controls all system functions, as well as after-filters, vibrators, powder levels, alarms and diagnostics.

**Recovery and Powder Reclaim Filter**
In compliance to safety and environmental regulations, powder must be contained within the application station.

The after-filter system provides containment of the powder circulated throughout the system (in accordance with the Minimum Explosion Concentration Regulation of ATEX). It captures overspray and returns it through ducting back to the ultrasonic sieve for maximum system efficiency and reduced operating costs.

The reclaim filter is equipped with Nordson® cartridge filters. Specifically designed for powder coating operations, Nordson cartridges provide and maintain maximum effective surface area throughout reclaim operation for the highest operating efficiency and performance available.

Cartridge filters are cleaned by reverse air pulsing, which is controlled by the PLC. This cleaning operation occurs when cartridge pressure drops down below set level. Filter cleaning reduces compressed air consumption as well as the noise level during operation.

The final filter, installed on top of the reclaim filter, provides powder containment within the system. However if required, the filter top can be connected to a chimney for venting outside.

For coating operations using different powders and colors, an optional high-efficiency cyclone can be used. In this instance, the after-filter will be equipped with a device that automatically discharges fine powder into a waste container.

**Powder Densification and Circulation Maximizes Transfer Efficiency**
Venturi powder pumps, mounted on the feed hopper, siphon powder and deliver it to a powder densifier for circulation. Patented densifiers remove excess conveyance air thereby increasing powder density. Powder is then passed through the feed tube set and enters the powder spray gun.

With this system, densified and concentrated powder exits the spray gun with minimum air turbulence for a stable powder flow pattern. What results is excellent material utilization and even, consistent powder distribution container to container.
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**Guns and Power Supply**
The aerodynamic shape and smooth engineered-material external surfaces of the Sure Coat automatic gun facilitate fast, easy powder cleaning and maintenance.

All connections for powder tubing and power cable for the integral voltage multiplier feature a quick-disconnect design. The gun is easily disassembled for routine maintenance to check for wear on all powder-contact parts. And the integral voltage multiplier is user-replaceable.

Spray nozzle extensions can be customized by Nordson to accommodate varying container lengths and diameters.

**Improved Coating Quality**
Powder coatings can provide a barrier to the walls and bottom of metal containers that is superior to conventional liquid sheetcoating processes. Coating with powder also allows for easy application of heavier film builds in one pass, if required.

FDA-approved powder coatings, developed specifically for container coating operations, are readily available from several coatings manufacturers.

**Productivity and Savings... All the Way Down the Line**
The Metal Container Powder Coating System from Nordson improves overall efficiency of container coating lines in several ways:

- **No VOC emissions**
- **No after-burners required**
- **Nearly 95% material usage with recycling of overspray**
- **No solvents needed, reducing waste disposal costs**
- **Ensures a clean, easy-to-maintain work environment**
- **Reduced cure and time temperatures**
- **Clean, environmentally friendly application process for operators**
- **Same high flexibility coating capabilities as wet coating**

**Simple, Easy-to-use Operator Interface**
The Vantage modular gun control system provides exceptional efficiency, flexibility and finish quality in automatic powder coating operations. A very simple operator interface, combined with state-of-the-art design provides easy adjustment and monitoring of gun operation.

Automatic Feedback Current (AFC) control automatically optimizes electrostatic parameters for maximum efficiency, coating coverage and finish quality for a broad range of part shapes.

The sleek, front panel design features push-type key switches and bright LEDs that are easy to use and provide long service life. User-adjustable AFC and kV settings allow complete flexibility in customizing spray gun parameters to meet the most demanding coating requirements.

The user can also choose to monitor actual kV or micro-amps during operation.

Flow-rate air transports a powder-and-air-mixture from the feed hopper to the gun. Increasing flow-rate air pressure increases the amount of powder sprayed from the gun, and may increase the thickness of the powder deposited on the part.
The Nordson Systems Approach to Container Manufacturing

Container manufacturers around the world rely on Nordson for a complete line of innovative container coating and curing systems.

Best Practices Pledge

At Nordson, our technology, equipment and expertise work together to offer the best solutions to our customers for their applications. This may result in better quality, improved manufacturing efficiency, less downtime, reduced coating material consumption, faster line speeds, or combinations of these and other factors that enable manufacturers to produce a better product at a lower cost. We work with our customers to improve their spray and manufacturing processes overall. It is with this continuous focus on Best Practices, that we partner with customers to find successful solutions for improved quality and productivity.

Nordson Package of Values®

Our exclusive Package of Values backs every Nordson product and system in every region and locale. The Nordson Package of Values includes: production testing, system engineering, installation assistance, customer service and operator training.

The combination of these features provides added value that is unmatched in the container manufacturing industry.