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I Got The Powder

A History Of Powder Coatings And How They Work

Powder coating is the process of applying dry thermoplastic or thermoset polymer powder particles electrostatically to an object, and then curing the powder under heat to produce a painted finish.

The powder coating process was first developed in the 1940s and early 1950s. Initially, organic polymers (or macromolecules) were “flame-sprayed” in a powder form onto metallic bases.

In the early 1950s, a German scientist named Dr. Erwin Gemmer developed, and then patented, a fluidized-bed process for thermosetting powder coatings. This method was much quicker and more efficient than flame-spraying, and from 1958 onward, almost all powder coatings were processed using fluidized-bed applications.

Dr. Pieter de Lange developed the electrostatic spray gun method in the 1960's. This process used air to fluidize powder coatings so they would adhere to metal in thin, even layers. The method was introduced in the United States, and rapid growth continued for the next 30 years.

The Clean Air Act of 1970 propelled powder coating processes to the further to reduce air pollution by eliminating VOCs.

Today, powder coating is used by many manufacturers of common household and industrial products. In North America, it is estimated that more than 5,000 finishers apply powder to produce high-quality, durable finishes on a wide variety of products.



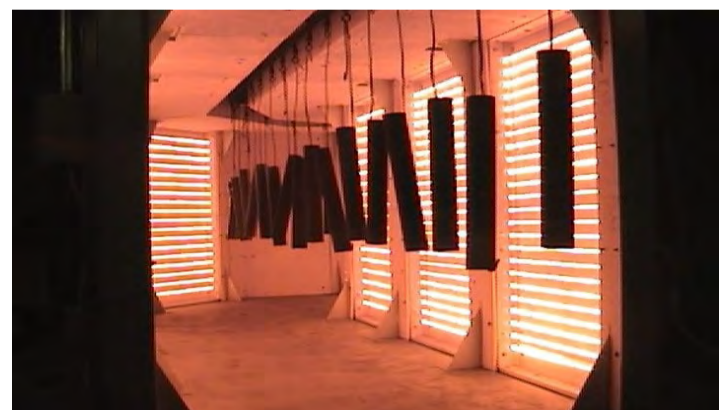
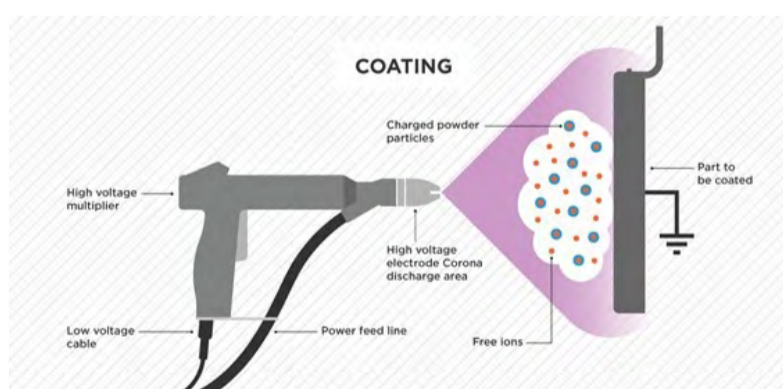
The Powder Coating Process

The process begins with cleaning the substrate thoroughly. This can involve prepping with an acid bath, using angle grinders, and/or sandblasting, and using compressed air to free the substrate of debris, and to smooth the surface to achieve the most even and smooth coating possible.

Generally, two kinds of polymer powders are used in application. *Thermosets* are said to reinforce the structural integrity of an item, making them particularly suitable for heavy wear-and-tear. They also supply the item with superior chemical and heat resistance. *Thermoplastics* offer a mixture of strength and flexibility. They are commonly used to coat heavy duty valves or for lining swimming pools.

Polymers and pigments are mixed in a hopper with a fluidizing plate. Air flows up through the hopper to keep the powders in a fluid-like state for application.

The most common way of applying the powder coating to metal objects is to spray the powder using an electrostatic gun, or *corona* gun. The gun imparts a negative charge to the powder, which is then sprayed towards the grounded object by mechanical or compressed air spraying and then accelerated toward the workpiece by the powerful electrostatic charge. Because of this attraction, the necessary air pressure of the applicator gun is usually low, about 2-5 PSI.



After the number of desired coating layers are achieved, the substrate is cured in an oven at about 400°F for about 20 minutes on average. These parameters may vary, depending on the powder coating materials used.



Advantages Of Powder Coatings

Powder coatings have several advantages over their solvent counterparts:

- Finishes are more resistant to scratches, corrosion, abrasion, chemicals and detergents because of the thermal bonding that takes place during the curing process.
- Superior color retention.
- No air-drying or flash-off time.
- It is very difficult to make powder coating run, drip or sag, resulting in significantly lower reject rates for appearance issues.
- No solvents, therefore the process emits negligible, if any, volatile organic compounds (VOCs) into the atmosphere.
- 100 percent of the powder over-spray can be recovered and reused. Over-sprayed powder can be reclaimed by a recovery unit and returned to a feed hopper for re-circulation through the system. The waste that results can typically be disposed of easily and economically.



According to reports from [Markets And Markets](#), powder coatings is projected to grow from \$15.7 billion in 2020 to \$21.4 billion by 2025, at a CAGR of 6.3% during the forecast period. The global powder coatings market is witnessing high growth on account of growing end-use industries and technological advancements. The economic growth in developing countries, stringent environmental regulations, and growth in the appliance & automotive industries are also leading to the growth of the market.

Need more for your powder coating business? The representatives from CIS, in partnership with Nordson Industries, are here to help. *Give us a call, today!*



Encore[®] LT manual powder spray system



Highest first-pass transfer efficiency, exceptional versatility and ease of use produce superior results for everyday manual powder coating.

Proven gun performance. Exceptional versatility and control.

The Encore[®] LT manual powder coating system is designed for rugged, everyday use. Incorporating all the right features at an affordable price, the Encore LT system is durable, easy to use and service, and offers superior transfer efficiency and overall coating performance for producing the highest quality finished products.

Manual painting made easy

The Encore LT spray gun is the lightest and best-balanced gun available today, with an ergonomic design that makes the painter's job easier. It incorporates PowerPurge[®], first introduced by Nordson, and a feature that operators now insist upon. The gun design also optimizes reach into part cavities, and improves maneuverability around and between densely racked parts.

Encore LT gun features include:

- **Proven performance** – helps painters achieve the most efficient, consistent part coverage and highest finish quality
- **100,000 volts** – delivering maximum first-pass transfer efficiency
- **Robust handle, trigger and cable design** – withstands the constant gun movement associated with manual painting, and assures easy serviceability when required
- **Auxiliary PowerPurge trigger** – cleans the powder path from the base of the handle through the nozzle, preventing internal powder build-up to ensure optimum spraying performance with a wide variety of powder materials



Compact pump delivers more

The compact, highly efficient Encore pump is engineered for excellent performance. Using less compressed air, the pump delivers more powder to the part, resulting in a much softer spray pattern that consistently delivers higher first-pass transfer efficiency.

- **More powder output with less compressed air** – for higher performance and energy savings
- **Lower velocity at the gun** – for more powder on the part, on the first pass
- **Fewer parts** – for lower operating costs
- **Lower velocity at the pump** for less wear and longer life
- **Quick-turn throat retainer** – for quick, easy routine cleaning and inspection of pump throat



Compact pump uses less air, delivering more powder to the part

Easy maintenance

With fewer parts and an innovative design, the Encore LT gun is completely field-serviceable. Its quick-turn nozzle retainer speeds nozzle removal for changing nozzle sizes or types, routine cleaning and color change. The quick-disconnect delivery hose also speeds cleaning and color change. And the gun's new handle design makes access to the powder path, trigger switch and cable easier than ever.



Handle design provides easy access to powder path, gun trigger and cable

5¹/₂ Year Warranty



Available in your choice of fluidized hopper or vibratory box feeder mobile system to meet your application needs

For more information: [Encore LT Manual Powder Coating Spray Systems](#)
See Nordson's Encore LT In Action By Clicking [Here](#)



COAST INDUSTRIAL SYSTEMS, INC.

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COMPANY OVERVIEW

Coast Industrial Systems, Inc. is the #1 supplier of painting and coating application equipment to the marine and manufacturing industries, and is proud to serve both San Diego and Mexico since 1986.

Coast Industrial Systems, Inc. has always placed the customer first, and strives for business excellence in all ways. Our friendly sales and customer service staff are knowledgeable, experienced and qualified to help meet your painting and coating application requirements, and to exceed your expectations.

**Graco Top 20 High-Protective Coatings & Foam Distributor
Award Winner 2010-2019**

