

Are We There Yet?

Knowing when it's time to install an automatic system and choosing the right one can mean material and labor savings, more repeatable results, lower VOCs and increased production.

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The evolution in finishing, stated simply, is from paintbrush to manual air spray to manual electrostatics to automation. Liquid spray finishing systems usually start with a manual, conventional spray gun operation. This is because conventional guns offer many benefits over hand painting, and the initial cost of equipment is usually minimal. However, as the operation grows and production requirements increase, they begin to encounter challenges, such as increased production rates. As production increases, other factors come into play, such as material usage, maintenance costs, increased hazardous waste, clean-up time and the directive to reduce costs.

It is now time to look at ways to reduce material usage and reduce VOCs. For various reasons, the most logical step is to consider manual electrostatics.

These systems are much more transfer efficient than conventional systems. This means that more material is applied to the work piece and less is lost to the environment, due to a basic law of physics, which states that "opposites attract." Additionally, hazardous waste is reduced, and disposal costs and booth cleanup and maintenance are reduced.

The piece to be painted is grounded and the paint is charged. This allows the electrostatic attraction to work its magic and apply more material to the product being coated. The electrostatic attraction, or "wrap," also helps cover edges and reverse surfaces, saving time.

Conventional, or nonelectrostatic spray, is a "line-of-site" operation. To coat an area, the spray gun must be aimed directly at the part to be coated. With electrostatic attraction, application is much more forgiving.



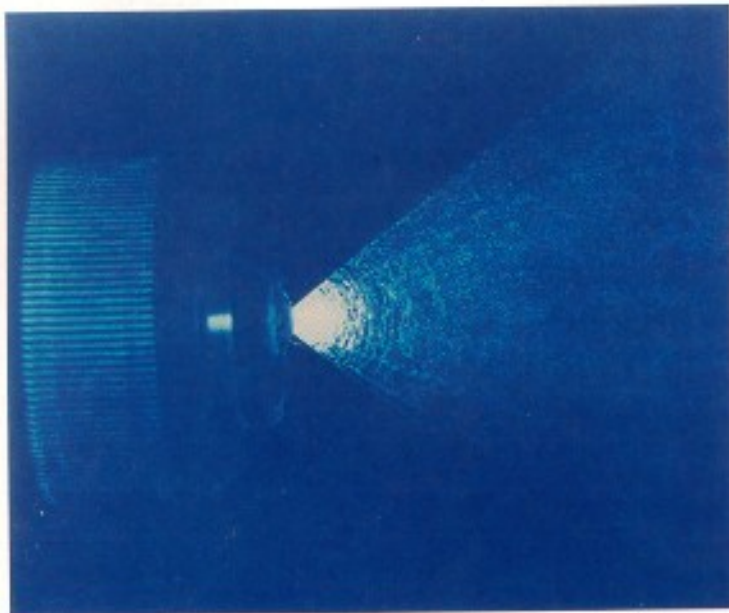
An electrostatic hand gun. (Photos courtesy of ITW Ransburg)

The electrostatic attraction, or "wrap," also helps cover edges.

Electrostatic wrap also helps increase production by eliminating the number of passes it takes to coat an object with conventional equipment.

When production increases to the point that the painters are no longer able to keep up with production and the demand for products using manual electrostatic equipment, it's time to automate the coating process. Upgrading to an automatic system has many benefits, including additional material savings, more repeatable results, lower VOCs, labor savings and increased production.

Many different types of systems are available, from a simple stationary stand with an automatic gun or bell to a disk system with an omega loop or a robotic system. The type of system chosen depends on many



Air-assisted airless electrostatic gun atomization pattern.



Bell-type automatic electrostatic rotary atomizer.

factors, such as the product being coated (its size, dimensions, corners, angles), part or hanger configuration, type of finish, coating, line speed, production requirements and desired improvements.

In addition to the type of coating equipment and conveyor, the type of system control required needs to be considered. This could be a PLC or PC control for triggering, closed-loop fluid control, closed-loop atomization air or shaping air. The type of control chosen will depend on the desired production outcome, anticipated return on investment, part configuration and other such criteria.

The purchase of an automated finishing system is a capital investment that can require varying levels of approval within an organization. Companies often desire to have a one- to two-year payback period, and a detailed return on investment (ROI) is required before a project can be submitted or approved. The payback can be in material cost reduction, increased production, quality improvements or reduced rejects. Remember, the cost of a reject can be three times the original cost of finishing once.

It is best to meet with a vendor or manufacturer that can explain all the different automation

options available. Working with a manufacturer or systems house can be very beneficial. In most instances, they know the industry and processes available and can help determine what best fits a company's needs.

Most equipment manufacturers have years of finishing experience and lab facilities that can closely simulate the painting operation. They use their client's parts and paint with their own equipment to show how an automatic system can be beneficial. Simulating the operation allows customers to "see" before they "buy." Based on the demonstration, material usage and appearance data can be generated to support the ROI needed to warrant the purchase.

Return on Investment (ROI)

Any upgrade to automated equipment, or the purchase of a new system, requires a justification and, in most businesses, a determination of ROI. Here is an example of a company—a manufacturer of computer chassis components—that upgraded to automated application equipment and controls. The operation has a product opening that is 18 inches wide and 48 inches high and a line speed of six fpm.

The old coating system was all hand-spray. It included a three-stage washer, a dry-off oven, four spray booths, overhead conveyor and a cure oven. The system was more than 20 years old.



An example of a bell-type automatic system installation is shown.