

What's the Real Cost of Downtime?

Making the right color-change decision in powder coating operations

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While powder coating as an industrial finishing method in North America remains strong, the potential for staggering growth opportunities are rapidly opening up every day throughout the Far East, in the Central and South Americas, in Europe and far into eastern Europe, as well as Africa and the rest of the world. In North America, it currently represents approximately 12% of the total decorative coating market. According to the Powder Coating Institute, approximately 5,000 industrial finishers in North America applied more than 370 million pounds of powder in 2006 to a countless array of products for high quality, durable finishes with improved efficiency and maximum compliance with environmental regulations.

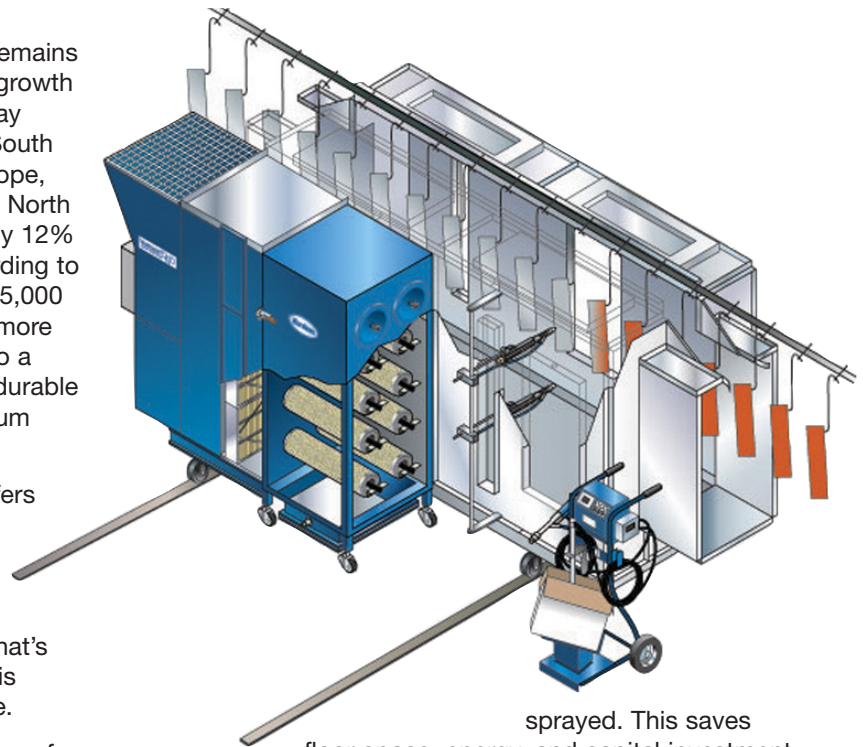
While there's no question powder coating offers a number of advantages, there are a number of questions to ask in deciding which type of powder coating operation is right for you. In today's lean manufacturing environment, downtime can be expensive. That's why one of the biggest questions to answer is whether to reclaim powder or spray-to-waste.

Spraying to waste may seem to contradict one of the major benefits of powder coating – namely the ability for coating overspray to be readily retrieved and re-used – but depending on your situation, it might actually be more cost effective. Nordson has developed a number of computer modeling tools to help in evaluating various options and variables in making the decision. Below, you'll find examples of a few different scenarios that demonstrate the cost differences between traditional color changes, fast color changes and spraying-to-waste with color-on-demand.

Technology Changes the Powder Picture

Concurrent with the technological advancements made in powder coating are new and innovative ways to apply the powder, and improve powder application efficiency. For some time, powder coating options have ranged from small manual batch systems, to fully automated multi-booth, roll-on and roll-off fast-color change systems.

Current technology eliminates the need for additional powder booths and color modules for each color



sprayed. This saves floor space, energy, and capital investment and provides the flexibility to spray any color without purchasing new equipment. Current technology also provides for color changes in as little as 5 to 10 minutes with powder reclaim systems and 20 seconds in non-reclaim systems.

Color changes of less than 20 seconds were not even an option just a few years ago, but new technology allows for changing color on the fly with near instantaneous agility. There are also new spray guns employing "dense-phase" powder delivery that can achieve more than 70% first pass transfer efficiency. Not only does this provide excellent powder coverage for difficult parts, but also dramatically cuts down on the amount of powder used – and wasted.

Like liquid paint kitchens, a number of powder delivery hoppers feeding a single manifold make nearly instantaneous color change a reality. This capability narrows the cost gap between reclaim and non-reclaim considerably as well. At the same time, powder manufacturing capabilities have evolved so that there may even be a wider selection of low priced powder coatings that factor into the decision.

To Recycle or Not to Recycle

Determining whether to recycle or not recycle powder is really a numbers game – calculating labor and material costs as well as the cost of downtime. In a lean manufacturing operation, the downtime cost might be worth more than labor and material. Setting the capital equipment budget aside, here are some common factors that might (and should) weigh in the decision:

- How many color changes (per hour, shift, day) must be done?
- How fast can color changes be made?
- How much labor is available for color changing?
- What is the labor cost?
- How close to capacity is the line?
- How much lost production (profit on goods) is lost during downtime?
- How expensive is my powder?
- How much ability to batch parts do I have?
- Burdened line cost per hour?

Next you must match the answer to these questions to some of the potential solutions. Although there are many models and options to select from, powder systems tend to fall into a few broad categories of powder equipment.

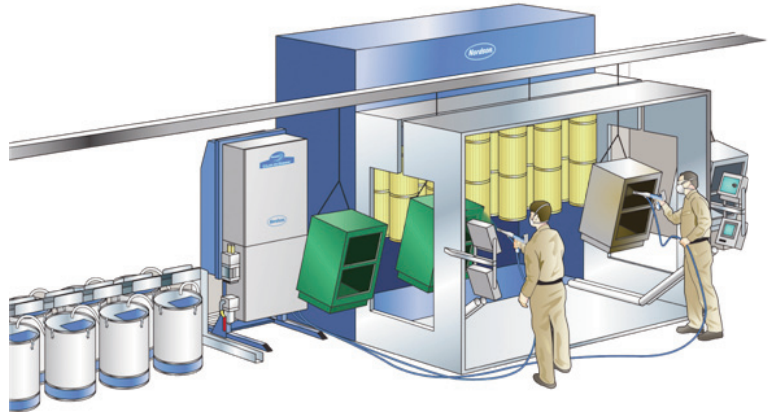
1. High volume color change systems

These have been the traditional workhorses of high volume production plants that run a few large-run colors and where it is possible to batch parts into longer production runs of a single color. These installations are great for reclaiming a high percentage of powder coatings yielding high overall system efficiency of 98.5%. Frequently, these larger booths require 30-45 minutes for a typical color change. This group also includes multiple-booth roll-on, roll-off designs.

2. Faster color change systems

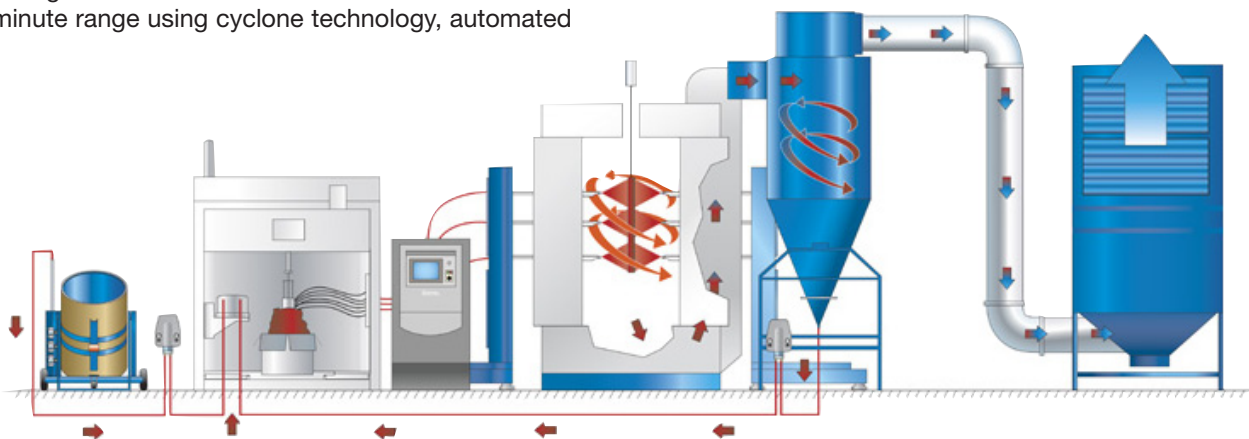
Over the past five years, a number of fast color changes systems have become popular. Color change times have been reduced to the 10-15 minute range using cyclone technology, automated

feed centers and new composite booth materials that are easier to clean. Self cleaning booths have been developed where walls and floors are automatically blown free of over-sprayed powder. These cyclone systems are popular with plants where several color changes per shift are required. Reclaiming a high percentage of powder coatings yields high overall system efficiency of 95%.

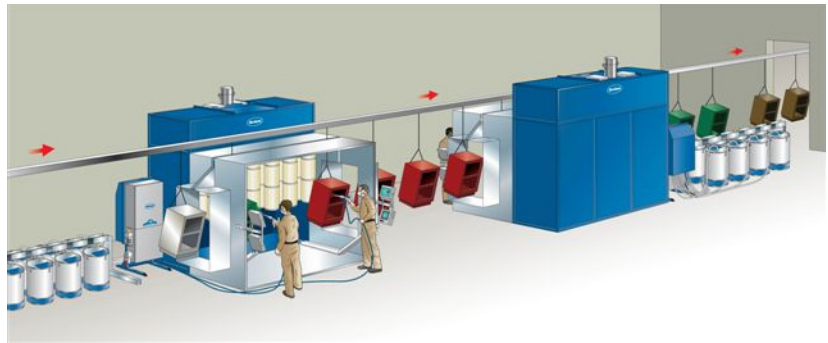


3 Lean Systems (Color on Demand)

The most recent developments in powder are systems where it may not be possible or economically justifiable to reclaim powder coatings. If the labor cost is high, the powder cost low and there are frequent changes, then spraying to waste may be the most sensible decision. Developments such as dense-phase powder delivery have provided enough boost in first-pass transfer efficiency that the cost gap of reclaim and spray to waste has narrowed considerably. An added weapon in the color change arsenal is the recent capability to automatically change colors in 20 seconds or less in a lean cell. This super fast color change capability allows guns and hoses to be rapidly purged for a second color.



Computer modeling tools can be used to test key parameters, such as lost production time. While plant supervisors and operators may focus on factors such as transfer efficiency, management may regard the largest impact of color change as lost production time. This is especially true of plants where the value of goods sold is very high and the plant is operating at high capacity utilization.



Maximizing Up Time

The value of lost production can rapidly tip the scale in favor of any approach that maximizes the productive “up time” of the paint line – quickly outpacing factors such as labor costs and powder savings.

The question might no longer be if quick color change powder coating is right for you, but which option is right for you. Today, all of the right tools are available to make good decisions. There are more technological options and tools to compare each option against any set of requirements. With so many powder coating choices, the possibilities with powder coating are tremendous as the technology continues to evolve.