

Faster is Better

Today's powder coaters want fast, efficient and cost-saving automated coating systems

In today's competitive powder finishing environment, faster is better. And when you're managing multiple colours on a line, it becomes a critical factor in determining a powder coater's success or failure.

"We see two trends right now in industry and both revolve around quick colour change," says Jerry Trostle, general manager, Wagner Systems. Based in Chicago, IL, he is responsible for North American sales of industrial equipment. "Many powder coating operations are managing multiple colours and they want fast colour change. They can do it using either fast powder reclaim or spray-to-waste systems."

Val Barone owner of Powder Coating Supply, Hamilton, ON, which distributes Sames powder coating equipment from Exel Industrial, Scarborough, ON, says that quick colour change is the main change he has seen in the past five years.

"The industry has seen long runs disappear for a few reasons. The first and most obvious is the migration of high volume products overseas where labour rates are lower. The second reason is that companies are trying to reduce their inventory levels by coating products just in time and shipping them out the door rather than stocking finished goods. With little or no inventory the runs become shorter and in most cases this results in many colour changes per day since colours can no longer be combined in one long run.



Nordson

Paul Kroes, Nordson Canada, Markham, ON, who supports powder finishers in Ontario, says quick colour change is indeed a big focus for powder coating operations today. One of the big changes that he's seeing in automatic powder coating systems is that more finishers are moving to spray-to-waste systems.

"It costs much more money on the face of it to spray to waste than it does to reclaim powder. But all the companies we have seen that have switched to spray-to-waste are doing it because they are lean manufacturing operations and production runs are much shorter."

In the past, traditional colour change systems such as conventional cartridge system booths, would have taken between 30 minutes and one and a half hours to change colour. People would buy two booths and roll one off to clean and spray with the other. That worked well as long as you had only a few colours. But once you got beyond five to ten colours, cost and space would become an issue because each colour requires a colour module.



Nordson's Lean Cell booth, above, features an innovative airflow design for powder containment. At the left are Nordson's automatic Sure Coat guns.

"So one of the considerations is going to a cyclone booth, spraying automatically with reclaim. But it will take ten minutes to reclaim, which is good as long as you're not doing more than five colours in a day.

If you did ten colour changes in a day and each one took ten minutes, you'd lose 100 minutes out of a seven and a half hour day of product time. And if you had 30 or 40 colours, you'd be losing half a day to colour change, so spray to waste is the best option in automatic systems because it's simply not worth reclaiming paint; the cost of the powder you blow away is less than the cost of lost production," says Kroes.

Nordson's latest fast colour change innovation is the "Lean Cell" system, which consists of the Lean Cell booth, the company's Prodigy manual spray gun and Prodigy Color-on-Demand instant colour selector. The Lean Cell booth is compact and features an innovative airflow design for powder containment. The manual gun system is a proprietary HDLV (high density powder, low velocity) technology that uses less compressed air to propel powder to the gun with less air velocity. The gun itself is automatically purgeable with either continuous or pulse purge. The Prodigy Color-on-Demand instant colour selector accommodates up to 28 colours at one time.

AUTOMATIC POWDER COATING SYSTEMS

Trostle says that while spray-to-waste is much quicker, "it's important for the customer to do the math and see what the cost impact is. You have to look at labour, downtime of the line and cost of the powder you're throwing away and then decide whether it is worth your while to reclaim or spray-to-waste.

"My experience is that most people

will find it to their advantage to reclaim overspray because it's much quicker and more efficient than systems from five years ago."

Wagner Systems' latest automatic powder equipment are the Supercube and Supertech automatic booth systems. Both systems incorporate a double-wall canopy for effective electrobarrier in pow-



Sames' D3P (Dense Phase Powder Pump) allows finishers to transfer high volumes of powder long distances.

der application. The double-wall canopy means there is an air gap between the interior and exterior skins of the booth. This provides an electro-barrier because air is an excellent electrical insulator providing higher transfer efficiency and minimal powder deposits on the wall.

Wagners' systems feature a patented CleanSweep concept that keeps the floor clean and blows the powder into the extraction slots. The floors of the booth can be walked on for cleaning and maintenance.

One of the issues with colour change in powder applications, whether it's reclaim or spray-to-waste, is contamination, says Barone.

"A big area of change is the ability to reclaim without contamination with quick colour change systems. Colour contamination is something you really have to look out for because it can result in a lot of costly problems with finishes," says Barone. Sames has developed a new EasyCompact fast colour change booth. As its name states, it uses less floor space and offers fast colour change.

"It offers a large number of benefits for the customer at a very attractive price. The stations for pre-powder or re-powder processes are built into the booth, so there's no need for an external platform. The powder station is ventilated by the main filter unit and the powder feed centre is compact, with no filter cartridges. The automatic zone is closed off by deflectors so the rest of the



Sames' automatic spray guns, Auto-Mach-Jet series, generate a constant voltage supply to the worked surface, providing high transfer efficiency.

thickness and uniformity of the powder on the part, we can lower the cost of the operation for customers," explains Trostle.

Nordson's answer to improving FPTE is its new High Density/Low Volume pump.

"With this new style of pump, we create a suction with the piston or different style of venturi and we pull it up into a pump with a set of chambers and then force it down a small diameter line out to the gun. It's a big slug of powder with a small amount of air as a carrier," says Kroes.

As well, the softer, slower powder delivery allows for better penetration of Faraday cage areas on parts, adds Kroes.

Sames answer to improving FPTE is its "D3P" (Dense Phase Powder Pump) that allows a finisher to transfer high volumes of powder long distances. D3P can be adapted to any existing bulk tank, and with dilution air, can be sprayed out of a powder gun.

Trostle says the biggest advancements in controls have occurred in the past five years.

"The ability to move guns and control what they do is now integrated into our control systems. So if an operator has a recipe for painting different parts that require different gun settings, the controller stores the settings such as stroke speed, stroke length, dwell time and other variables." ITW Gema has the AutoTracker 2.0 programmable logic control which automates standard booth components. Photo cells or a light curtain provides incoming part recognition and automatically triggers guns on and off as needed. It performs automatic line purging and a "part recipe" system automatically adjusts optional analog powder delivery controls, optimizing gun current, voltage, air mix, flow rate and other settings for each application style.

Quick colour change and integrated control systems will continue to evolve, but one of the bigger changes that may well transform automated powder coating systems is robotics.

Barone, who represents Sames, a big name in Europe, has his eye on developments in the European market, which tends to be steps ahead of the North America market.

"The use of robots is one possibility for the future, but is still expensive for most powder coaters. In some cases, the quickest of colour changes is still not quick enough. This puts a greater emphasis on transfer efficiency since the powder is being sprayed to waste. Dense phase powder pumping will be used more in certain specific applications where there are a lot of corners that have to be touched up quickly." Barone adds that he expects to see further developments on powder bell applicators. He says "it's a big trend and gives you a very high-quality finish; there is also a great improvement in transfer efficiency."

What is significant about all the changes going on in automated powder systems is that these systems are beginning to have many of the benefits of liquid systems.

In the next five years, you can expect to see some sophisticated powder systems coming on line with integrated controls and robotics. **CM**

booth remains powderfree during application. The operator cleans the entire booth from the outside using an ultra-light blow gun.

The automatic spray guns in the system—Auto-Mach-Jet—generate a constant voltage supply to the worked surface, providing high efficiency transfer. The guns are designed to provide excellent powder penetration in parts with complex shapes. The system features a tough, reliable sifter with a perforated plate fitted at the bottom of the cyclone.

ITW Gema's answer to the fast colour change demand is its Magic-Cylinder powder coating system. "By specializing in automatic coating, fewer manual coating stations are required—which keeps the booths' footprint small," says ITW Gema in its literature for the MagicCylinder.

The product is a 15-minute quick colour change system that features a compact, cylindrical interior and ITW Gema's "Chameleon" colour management system.



Wagner

Wagner Systems' automatic booth systems incorporate double-wall canopies for effective electro-barrier in powder application. They also feature a patented CleanSweep concept that keeps booth floors clean and blows powder into extraction slots.

One of the features on it is its ability to virtually eliminate colour contamination. It's made with seamless ductwork, which minimizes the risk of colour contamination, requires no cleaning and is maintenance-free, says ITW Gema. The system has an automatic cleaning process which uses pulsed compressed air that flows over the gun exterior and throughout the powder path, including the suction tubes, pumps, powder hose and gun, virtually eliminating colour contamination.

One of the keys to successful quick colour change is high transfer efficiency, or as Kroes puts it, "how do you get more powder to stick on the part?"

The secret lies in pump technology.

Wagner has patented a new design, a venturi-style pump that uses 50 per cent of the compressed air of older pumps to pump the same amount of powder into the system.

"This leads to the other big trend in automated powder coating systems today; systems that soften the delivery of powder at the end of the gun. Wagner has tried to simplify it to improve First Pass Transfer Efficiency (FPTE). If we can control film