

Around the Bend on POWDER COATING

Switch to manual powder boosts finish quality at architectural parts maker's plant

When Rick Morris looks at one of his explosion vents, he sees a thing of beauty. "With its tough new powder coat, this is a work of art," says the VP and general manager of CS Construction Specialties Co., a custom manufacturer of aluminum products for the architectural industry, making louvers, grilles, sun controls, entrance flooring, expansion joint systems, and yes, those finely sculptured explosion vents. "Our lines of explosion, tornado, flood, and heat vents are made for heavy-duty use in buildings, so our coatings have to be resilient and durable for the task."

From his Toronto, ON, location, Morris takes obvious pride in doing guided tours for visitors to his 45,000 sq ft facility, pointing out how much the operation has grown since the US-based CS Group opened its Canadian division in 1959. By solidifying partnerships with the country's biggest general construction contractors, the company has since doubled its operations and is currently planning further expansions of its physical plant.

To meet its growth targets, CS Construction Specialties recently introduced a state-of-the-art powder coating department that meets strict AAMA (American Architectural Manufacturers Association) specifications. Until recently, the company was relying on mixing a large volume of wet, solvent-based coatings. That liquid coating, called Kynar (a thermoplastic fluoropolymer, or PVDF) has been the industry standard for years.

"But it was the environmental factors associated with wet, solvent-based coatings, such as the disposal of waste and the health and safety of our paint operators that we needed to address," remarks Morris. Because almost all of his company's production is customized and most in small batches where almost no two parts are exactly the same, it was decided that a manual powder coating process was the best fit. "It's almost impossible to get 100 per cent coverage in our louvers using an automatic system, so manual is the way to go," he adds.

After examining the products several prospective suppliers at the 2006 Powder Coating trade show, Morris and his management team ultimately selected the dense-phase Nordson Prodigy system, sporting the latest in HDLV (high-density powder, low velocity air) technology.

CS is a pretty lean company in that it builds and ships what it needs today, so every day is a different group of products and that means applying many different colors over the course of every shift. As well, its louvers tend to direct air and powder away from the parts—not very conducive to powder coating. "The Prodigy gun is exceptional at coating our Faraday Cage areas for high transfer efficiency," states Morris. Most of the expensive paint stays on the part, and less time is required to coat each part because the painter doesn't need as many passes."

In developing the HDLV pump, Nordson's main goals were clean-ability and serviceability. "Our pump is made so that the interior components are easily removed, cleaned and replaced,"



(Above) VentCore bake oven and controls. (Right) High Density Powder Low Volume Air (HDLV) spray gun and control system.



POWDER COATING/CASE STUDY

states Paul Kroes, powder systems specialist for Nordson Canada in Markham, ON.

Similar in action to the human heart, the HDLV pump operates by suctioning powder into the pinch valve, which can open and close every 250 milliseconds, and is designed to operate at a wide range of cycle times to deliver powder from 6 lb of powder per hour (50g/min) to 60 lb/hr (450 g/min). Nordson engineers have devised a closed-loop airflow module (iFlow) to serve as a sort of “cruise control” for powder pumps, transforming fluctuations in input air into electronic control signals to compensate the pump operation.

Due to the many short daily runs and the rapidity of colour changes, Morris appreciates Prodigy’s quick-change artistry, stating that it takes only seconds to change colours with this gun; most other systems take 3-10 minutes per color. A built-in purge function allows powder coaters to automatically and quickly purge the pump, powder delivery hose, and the powder path of the spray applicator.

“These factors produce a system that can be automatically purge-cleaned in as little as 18 seconds—without disassembly,” says Kroes. “A spray operator only has to blow off the outer surfaces and move an intake tube of the pump into a new powder feed hopper.”

And what of the spray pattern? “Our guns deliver the powder to the spray applicator virtually without air, and we can achieve



Powder spray booths strategically placed for easy flow of materials through the system. Strategic use of windows and skylights enhances the facility work environment.

the spray pattern of the desired size while still keeping the total air volume to a minimum, a big plus for us,” nods Morris.

CS also opted for two Nordson Vantage powder coating booths, which are positioned as a pair of opposing booths, each with a Prodigy powder gun. As the assembly line passes through the first booth, a painter coats one side of the part; the other side is completed in the second booth. “Our parts range from small rivets to sections that are 20-ft long and eight ft high, and we’ve found that the Vantage system is effective



CS Construction Specialties VP Rick Morris with the Nordson Prodigy gun.

and economical, as well as highly configurable and customizable for our needs,” says Morris.

The Canadian arm of CS Group is the first to convert to powder, pioneering the technology for this company with a global reach. A year after the Prodigy installation at his plant, Morris

says the system is functioning to perfection with the capability to boost production as the company continues to attract an increasingly diverse customer base. “Our American counterparts are equally as impressed with Prodigy and will soon be switching to it,” he notes.

In keeping with its commitment to go green, CS is currently searching out cleaner, more environmentally-friendly solutions for its pretreatment chemicals. And for his powders, Morris draws on Spraylat industrial coatings, Tiger Drylac and PPG.

“We’re an approved applicator for all these high-performance coating brands—we do that to meet the stringent demands of the commercial and industrial architects we work with, who insist on certain paints and specific colours,” he says.

VentCor Systems crafted the customized cure oven at CS. Its three-rail design offers Morris loads of capacity. “This batch oven maintains a temperature of about 450°F, and most of our products require about 20 minutes in the oven,” he explains. “It’s flexible enough for just about any configuration we want—now and in the future.”

Many of the pros of using Prodigy have already been realized, according to Morris, including reduced contamination, better transfer efficiency, improved coverage and Faraday Cage application—advantages stemming from the system’s reduced hose sizes, softer powder cloud, and longer electrostatic dwell time.

“This brings other benefits such as reduced labour and lower powder consumption, resulting in increased profitability,” affirms Morris. “These savings have given us a payback in less than a year of purchasing this advanced technology. But most important, our coaters are now operating in a cleaner, safer work environment, spending more time painting and less time doing colour changes.” **CM**

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