

Overspray

AUTOMATIC FINISHING ■ BY JACK KOHANE

“Green” Powder

Decision to bring automated powder coating operation in-house pays off for BC window component maker

Because its products provide quality that is measured in decades, not years, Starline Windows offers its customers only the most durable coatings possible. It must be doing something right. The Langley, BC, maker of specialized aluminum and vinyl window components for high end, high rise residential projects for builders across Western Canada and the US West Coast has been doing it steadily for 40 years.

“High rise construction demands that shipments arrive on time, because unloading space and cranes must be booked days or weeks in advance, and often there is no second chance,” says Pat Murphy, lean manufacturing manager at Starline. The company shapes about 140 different extrusions of aluminum profiles (such as window flashings, panels and corners) sourced from Sapa Canada in Vancouver, BC, and from Apel extruders located in Calgary. To help ensure the parts his crew produces continue to be done right the first time, Murphy gave the green light to several critical decisions.

A critical first decision was switch its outsourced finishing operation from liquid to powder coatings. Parts were sent to outside vendors who sheathed the components in Duranar, a liquid fluoropolymer. Finished parts were then returned to Starline’s facility and stockpiled until shipment to construction sites.

During his exploration of the available options, it was clear to Murphy that the best approach was not simply to move to powder coating, but also to bring the entire finishing operation in-house. “Powder coating was chosen for several reasons. It is environmentally friendly and extremely durable, thus meeting the exacting demands of our customer base,” he explains. And by partnering with good quality powder and chemical suppliers he says Starline is now able to ship products that not only meet stringent AAMA 2605 requirements, but are also superior to liquid coated products in many ways.

The cost of a coating failure on a high rise is substantial. As such, Murphy takes extraordinary measures to ensure that never happens. He adheres strictly to tight process controls and precise tracability, combined with rigorous internal and external testing protocols. “By having the right



Starline’s aluminum extrusions now powder coated in house using an ITW Gema system (powder feed system seen below) offer longer-lasting quality.





equipment in our plant allows us to confirm we have conforming product rather than trying to weed out rejects,” he says.

The next critical decision was selecting the right powder coating equipment. When he came across ITW Gema’s Magic Compact booth, (ITW Gema is based in Indianapolis, IN, with a Canadian office based in Oakville, ON) he liked what he saw. The Magic Compact has Luminaire plastic sandwich-wall booth surfaces that are non-conductive to minimize powder accumulation in the cabin for a faster colour changeover. The mono-cyclone system has a built-in sieve that screens out contaminates for easier clean-ups. Dense-phase transport technology, that uses less compressed air than traditional transfer pumps, offers improved material handling of the recovered powder from the cyclone.

Murphy cites key reasons for selecting the booth: “on top of the benefits of quick colour change and coating quality, these booths are amazingly efficient. From a quality standpoint, we need the best equipment to maintain consistent coating thicknesses over a wide range of extrusion profiles. We use an ultra-durable flouropolymer powder from Akzo Nobel that has a very tight allowable thickness range of 2.4 to 3.2 mils. We must be within that tight window to achieve AMMA 2605 certification.”

Top left and bottom right: ITW Gema’s Magic Compact powder booth has allowed Starline to improve finishing efficiency.



Since powder is typically a much more durable finish, Starline has found that rework has virtually been eliminated; there are no more blemishes caused during manufacturing or shipping.

While recognizing from the outset that the Magic Compact could provide performance to match his company's increasing volumes, currently numbering at about 80,000 units per year, it was only a month after having it installed that Murphy determined that his other old booth also needed to be replaced by a second Magic Compact.

Installing the two-booth powder line, which runs 24 hours a day, has proven efficient because it allows painters to paint whatever quantity of a colour is slated for the day's production. Each booth is equipped with two older model manual guns and eight Gema OptiGun 2AX automatic powder guns triggered by menu-driven computer gun controls.

One painter (per shift) runs the two booths, charged with the primary responsibility to select the correct menu for the profile being painted. X and Y light curtains at the entrance of the booths determine the target distance to the profile and move the guns to the proper location automatically. The stroke and travel speed of the guns are also automatically adjusted based on how many parts are on a load bar and where they are located. "It took some time to dial in the parameters when we set the equipment up, but it works flawlessly," remarks Murphy.

The self-cleaning feature of the booth is another element that appealed to Murphy. "They stay amazingly clean even when we are painting dark powders. Along with the self-cleaning guns, the booth floor has flaps that rotate up making cleaning very easy. We have found that quickly blowing the walls and floor down is all that is required between colour changes, even going from dark to light."

In choosing Gema's powder finishing equipment, Murphy says his team has taken a giant stride towards Starline's Lean manufacturing goal. With a paint line that makes 25-plus colour changes a day, he needed equipment that would allow his to meet that requirement. "Our power and free conveyor sends a load bar out every four minutes and our one painter is able to clean and prepare a booth for a new colour in eight minutes (two bars)," he explains. "This is an incredibly powerful tool for us because we need to be responsive to our production schedule, and our rushes from installation crews on construction sites."

The booth walls stay clean while in use and the floor is automatically cleaned by an air blow system.

"When we do a colour change, the gun cleaning is done automatically by the integrated colour management system and the booth floor opens up for easy access," says Murphy.



Pretreatment, part of Starline's finishing operation above, and the ITW Gema powder booth system control at bottom.





Starline's dual-booth system has helped boost productivity and keep up with the demand for products.

The [ITW Gema] Chameleon Colour Management System uses PLC intelligence to automate cleaning by pulsing compressed air over the gun exterior and throughout the powder path, including suction tubes, pumps, powder hose and gun.

A big plus is that powder coatings are "green" finishes so there's no costs associated with hazardous waste disposal. TE is also good; tests Murphy has conducted show a 97 per cent TE. "We have realized a substantial cost reduction over our previous system in scrap powder," he lauds.

In its quest for LEED certification (Leadership in Energy and Environmental Design), including no VOC emissions and using chrome-free conversion coatings, fluoropolymers help boost Starline's profile as an environmentally conscious organization.

Murphy says that the move to bring a green finishing system like powder in-house was the right decision for the company.

"It has had nothing but a positive impact on our business, both for us and our customers," he declares. "We're extremely happy with the results achieved." **CM**

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