

Powder Coating of Extrusions Comes to North America

Vertical powder coating has practically taken over the finishing market in Europe, especially in the aluminum extrusion architectural market. It has long been utilized for its excellence in finish, high performance characteristics, competitive cost per applied square foot and negligible VOC emissions. The popularity of powder coating can be directly attributed not only to its ease of use, and cost reduction, but to the variety of finishes and textures available. Evidence of powder's increasing acceptance is demonstrated by the recent installation of two (2) vertical powder coating systems in the United States.



In powder coating, the finely ground particles of pigment and resin are electrostatically charged and sprayed onto an aluminum substrate. Powder coatings adhere to the extrusions when negatively charged powder particles are applied to neutrally grounded parts. Electrostatic application of the powder coatings also improves transfer efficiency and coverage of the extrusions.



Two prominent extruders currently provide powder coated aluminum extrusions to their customers.

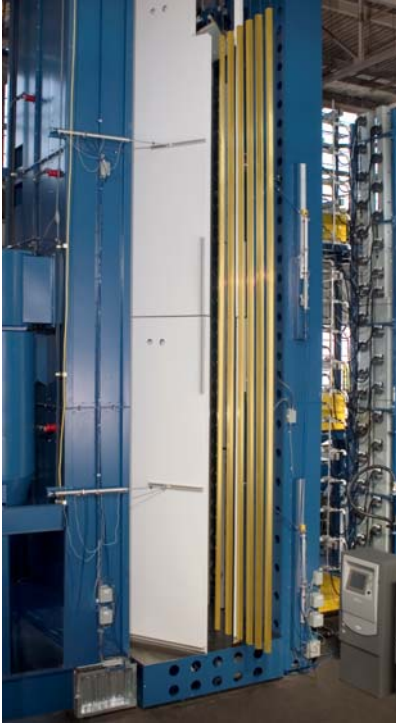
One extruder's powder line incorporates the latest Trevisan Tellkamp technology utilizing a cascade tunnel pretreatment system, three powder booths with powder recovery, automatic powder guns, and convection ovens with supplementary infrared heating to cure the powder paint. The powder line has a maximum speed capacity of 12 ft/min with dense packing, so that its average output is 5,000-7,000 lbs/hr.

Their powder line has three powder booths, which makes for rapid and easy color changeover, with as many as 20 color changes per shift possible on the line. The parallel operation of the multiple booths on the vertical powder line allow for large and short batch runs with different colors together on the same run.

Woodgrain appearance is also available on the system and requires a randomly applied powder pattern that mimics natural wood color and texture over a partially set powder basecoat.



This is done in a three-stage process including two additional powder coat booths and special ridged roll system that mechanically distributes the loose powder into a wood grain effect before curing.



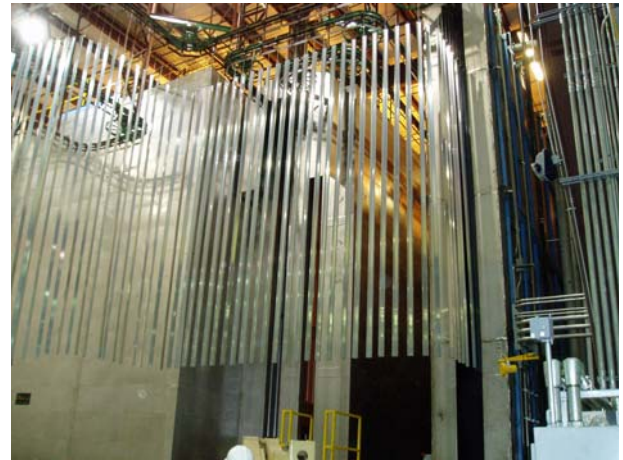
Similarly, the second notable large scale extruder is breaking ground in the vertical extrusion market with new technology from Nordson Corporation. The system contains two automatic spray booths that are able to powder coat extrusions at line speeds up to 25-feet per minute. The system now produces over 1,000,000 pounds of aluminum per week with first-pass transfer efficiency exceeding 75%.

Partnering with Belco for the system’s design and installation, the booths are constructed of patented Apogee® material, which is durable and lightweight and resists powder attraction, making cleanup and color change less time-consuming and labor intensive.

The two booths feature a ceiling, which automatically lowers during booth cleanup and color change. Along the perimeter of the ceiling are a series of air nozzles, which blow unwanted powder from the booth walls as the ceiling descends. As the ceiling is lowered and the volume of the booth shrinks, the air velocity in the booth rises, creating a turbulent air stream, which dislodges powder and cleans all surfaces completely.

The entire powder coating system is controlled by Nordson’s iControl® integrated control system, which provides for recipe driven automatic electronic control of all system parameters including booth airflow, spray gun air control, electrostatic control, powder pump operation, gun triggering, part detection and gun motion control.

This extruder’s system also includes non-chrome spray pretreatment, convection ovens with supplementary infrared heating for powder cure, an I-Beam conveyor system, and an environmental room for the application of the powder.



Today’s powder coatings offer an outstanding range of properties and performance. Improvements in powder application technology has led to greater consistency in film thickness and lowered applied powder costs. Textures can be added to mimic the look and feel of real wood. Powder coatings are available in a wide variety of colors, glosses and finishes including metallic’s all with just a single coat application. So why has it taken powder coating so long to reach the extrusion market in the U.S.? The answer is pretty simple. The American manufacturer is extremely demanding. It is only recently that process controls have improved to the level that meets the high productivity and performance standards required by U.S. manufacturers.