



Flexible Equipment & Teamwork Are a Successful Combination For Michigan Powder Coater

The shop floor at Kentwood's new facility has plenty of room to modify or expand operations.

Two modern powder coating facilities, designed for fast color changes and operated by a trained team of professionals, are giving Kentwood Powder Coat, Inc. an edge on providing fast turnaround of high-quality. The jobshop specializes in finishing parts for the plumbing, appliance, automotive and hardware industries.

Innovation and teamwork are paying big dividends at Kentwood Powder Coat, Inc. of Grand Rapids, MI. Opening its first plant in 1988 in a 30,000 ft² building, the company started operations at its new Plant #2 in December 1996—a 31,000 ft² facility adjacent to, but completely separate from the existing line. Each plant offers modern, efficient powder application processes for a wide range of sizes, shapes and substrates. The company specializes in high-volume finishing of parts that require stringent quality standards, according to Bill Andro, general manager. Both plants employ about 60 people, each running one eight-hour shift, five days a week. Andro expects about 100 people to be employed at Plant #2, when it is operating at full capacity.

Process Lines

Line #1 at Kentwood is a 660-ft conveyor line designed to be flexible for servicing customers from many different industries. It operates at speeds ranging from 5 to 10 ft/min. Some innovative scheduling is necessary so that changes in shapes, sizes and substrates can be accommodated. A part that can be run at 10 ft/min, for example, will be followed by

other parts that can be finished at the same or a similar speed, even if a color change is required. This is possible because color changes on line #1 can be made in 15 min or less, Andro said.

Line #2 is a 750-ft conveyor that can process all chemistries of powders, including acrylics, clear coats and whites. The line has a unique coating room that provides an ideal environment for generating high-quality output. The room is built to maintain a temperature of 60 °F, even when it is 100 °F outdoors. Line #2 is completely computerized, and designed to make automatic adjustments for shapes and sizes of parts.

Both conveyor lines are equipped with a sanitary pan that runs beneath the overhead conveyor to protect parts from contamination. The pan is positioned along the conveyor line between the rollers



Booths for hand spray application are designed to run in conjunction with automatic spray booths to improve quality and efficiency.



This 216-kilowatt infrared preheat oven “gels” powder before it enters the convection oven for curing.

and the hooks that hold the racks. Dragout from the rollers drips on the pan, not on the parts being processed.

It takes about 1½ hr to complete parts from start to finish on line #2, says Andro. With the line fully loaded, it can hold more than 30,000 lb of parts. It is designed so that it has the capacity to coat more than 84,000 small parts per hr.

Pretreatment

Line #1 has a five-stage iron phosphate washer pretreatment system. Ferrous and nonferrous substrates are processed. The system has a closed-loop, automatic process controller to monitor chemical concentrations every six seconds in stages 1 and 3. Chemicals are automatically added when they become low. A 10-ft drain between each stage helps to prevent contamination between stages.

Line #2 features a seven-stage stainless steel washer that is also equipped with computerized monitoring for automatic adjustments. Both systems include a reverse osmosis process that provides pure, deionized water as a final rinse.

Application

Both lines are equipped with automatic and hand powder booths. Line #1 features an automatic booth with spray guns that can be adjusted to accommodate any configuration of parts. Parts are mostly coated with polyester or epoxy powders in colors, clear coats and specialty finishes.

Line #2 is designed to process all powder chemistries, including acrylics, clear coats and whites.

Quick color changes and be made on line #1—even from black to clear coat. Andro said it takes longer to change from dark to clear than to make changes in the same color range, but as mentioned earlier, spray booths can be cleaned in 15 min—sometimes less. Color changes are made on each line more

than 40 times per week.

Line #2 includes computerized spray guns that turn on and off

Contractors for Kentwood Powder Coat, Inc.

- Ovens, pretreatment system, conveyor and computerized system: Belco Engineering.
- Building construction and design: DVK Construction.
- Process consulting: Roger Talbert Consulting
- Electrical: DVT Electric.
- Reverse osmosis deionized water equipment: U.S. Filter.
- Heating, ventilation and air conditioning: Grand Rapids Industrial Process.
- Powder coating booth and guns: Gema.
- Infrared oven: P.E.D. Technologies.
- Lift truck and storage racks: Yale.

through a programmed parts-recognition system. Adjustments can be made on-line with the program. A computerized energy management system shuts down all gas- and electric-consuming components in the line when it recognizes that there are no parts to be processed.

Teamwork is emphasized on both lines. Workers loading parts onto racks, for example, know the scheduled production run well in advance and are kept informed of any changes



A reverse osmosis system is used to clean contaminated water and provide deionized water for rinsing.

in the schedule. Andro said teamwork allows gaps in the line to give operators time to make gun adjustments when changing parts, but the line never stops.

Overspray is recovered through custom ductwork from the spray booth. A high-velocity cyclone is used to separate the reclaimed powder and return it to the hopper. The air is filtered through a cartridge collector before it is released from the booth.

Racks

Kentwood services a large number of regular customers, so the company designs custom racks for each part. "It costs more initially," said Andro, "but it gives us the advantage of maximizing line density and minimizing unit price. That increases our production and powder transfer efficiency, which ranges between 90 and 95 percent."

Kentwood is also equipped with two in-house burn-off ovens. Andro said it is one of the best investments the company has made, because racks can be cleaned as often as necessary without delay. "That's the nature of this business," he said. "You can't afford not to be ready when the customer walks in or calls."

Oven System

Kentwood's curing process on both lines is designed to be versatile to handle a variety of parts, substrates and powder coatings. Both lines are equipped with a combination gas-fired convection oven that dries parts on one side and cures on the other. Most parts run through the dry-off side after pretreatment.

The new line is equipped with a 216-kilowatt infrared preheat oven to "gel" powder prior to entering the gas convection oven for curing. Cure ovens are fully insulated and designed to hold a temperature range of no more than a 10-degree variation from the temperature setting at any point in the oven. Readings are displayed continuously to verify the consistency of the process.

Quality Control

Andro says special emphasis is placed on high quality standards at the operation. When a new job is accepted, the company spends time and money to make several trial runs with a small number of parts to ensure that a quality finish can be provided. "It costs more, but you don't run the risk

of coating a large number of parts to find that they have been done incorrectly," Andro said.

Written quality assurance plans are developed in cooperation with the customer.

Measurements for film-thickness are taken continuously on-line, with adjustments made as needed. Statistical process control techniques are used to track film thickness and other variables. The company also has a fully equipped test laboratory to perform all standard tests, such a salt-

spray chamber and color light booth. Tests for adhesion, hardness and abrasion are also conducted.

The extra effort has been worth it. Kentwood was recently selected by plumbing parts manufacturer Moen, Inc., as an "Effective Partnership Increasing Customer Satisfaction (E.P.I.C.S.)" vendor.

"Our customers rely on us," Andro said. "Not only must the parts be perfect, they must be processed quickly—and we're ready to meet the challenge." **P&SF**