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Chilly Business Heats Up

Powder Coating System Gives Lean Edge to Refrigeration Manufacturer

Buy a pound of deli meat, a gallon of milk or a carton of eggs from just about any grocery store, and chances are Kysor//Warren will be there. For more than a century, the company has manufactured refrigeration solutions for the super-market industry. It is a leading manufacturer of frozen, medium temp and heated display merchandisers and mechanical refrigeration systems used by many major national and regional grocery chains.

Kysor//Warren differentiates itself from the competition by offering quality products customized for each order at a good price with the shortest possible lead time. To help meet those objectives, the manufacturer began powder coating in 2001 at its Columbus, Georgia facility.

“Powder offered a more durable finish and much less environmental challenges,” says Matt Goodson, paint technician, Kysor//Warren.

Powder coating proved to be a valuable addition in the manufacturing of refrigeration display cases, especially as the company changed colors on average 90 to 100 times during each two-shift day. But as it moved to incorporate lean manufacturing processes to improve flow of materials throughout the plant, its powder coating line came under greater scrutiny – especially product density on the line. At the time, there was a 56-foot gap between parts for every manual color change.

“We had to improve line density,” says Goodson. “Wasted space meant wasted time and money.”

Older application technology meant spray-to-waste color changes took up to three minutes, which really added up with 100 color changes or more on any given day. Kysor//Warren also wanted greater control over film thickness and less powder waste.

“The HDLV technology makes it easier to consistently get between 2 mils and 3 mils,” says Goodson. “We now have one of the best lead times in the industry, as well as top-to-bottom quality from assembly to paint and everything in between.”



With decreased line spacing, Kysor//Warren picked up an additional three hours of production time each day – without actually working three additional hours. The company also reduced wasted powder 25 percent.

Denser is Better

Kysor//Warren wanted to dramatically improve part density on its refrigeration display finishing line, which would lead to increased production. The long-term goal was to coat 70 percent more units per week than its current capacity. According to Goodson, the increased production goal was not possible using the older application technology.

Paint line managers heard about new coating technology from Nordson, known as the Prodigy® HDLV® manual gun system. Skeptical because the technology, which used high-density powder and low-velocity air, was so new, the company tested one of the Prodigy guns on its powder line. Comparing data from the new gun to the existing older technology revealed the dense-phase powder coating technology did in fact lead to increased capacity and less wasted powder.

The company replaced its older guns with two Prodigy guns, as well as Prodigy HDLV pumps and controllers. The switch to dense-phase powder coating technology helped Kysor//Warren realize a staggering 50 percent increase in production. Combined with its expanding lean processes, the company also significantly increased line density by reducing line spacing by nearly 70 percent to just 18 feet.

Before entering the powder line, parts go through a nine-stage wash. The wash includes a cleaner, series of rinses, non-heavy metal phosphate treatment, additional rinsing, sealing, a fresh water rinse and finally an RO rinse. Parts are then dried in an oven for 10 minutes at 400 degrees Fahrenheit. After coating, parts spend 20 minutes in a curing oven at 400 F.

True Colors Revealed

Each refrigeration display case is manufactured and powder coated based on a custom order, which means 90 to 100 color changes on average during each two-shift day. Kysor//Warren offers approximately 150 colors with 40 or 50 different colors used regularly, and will add more colors as customers request them. The manufacturer uses hybrid powder coatings from several suppliers, including Trimate Powder Coatings, IVC Industrial Coatings. Cases requiring black or white are coated on the same line, but using an automatic booth with reclaim capabilities.

Use of dense-phase powder coating technology has led to a decrease in color change time by as much as 70 percent. Non-reclaim color changes that previously took from 1.5 to 3 minutes now take about 30 seconds. The faster color changes are achieved by an automatic purgeable design in both suction and transport directions in the guns. The booth design also enhances color change speed through evenly distributed airflow and a powder-resistant canopy, so airborne powder can be evacuated quickly during color change while eliminating cross contamination of colors.



Use of Nordson Prodigy® HDLV® technology has led to a decrease in color change time by as much as 70 percent. Non-reclaim color changes that previously took from 1.5 to 3 minutes now take about 30 seconds.

“We’ve increased the number of color changes, which goes against what you’d normally want when focusing on lean production. But when you cut color change time by 70 percent, it works really well toward increasing production,” says Goodson.

The decreased line spacing means Kysor//Warren picked up an additional three hours of production time each day – without actually working three additional hours. The company has also reduced wasted powder by nearly 25 percent. The high-density powder, low-velocity air of the guns and pump propel more powder with less air so Kysor//Warren gets a softer delivery of powder with minimal overspray and higher transfer efficiency. That has also led to better control of film thickness.



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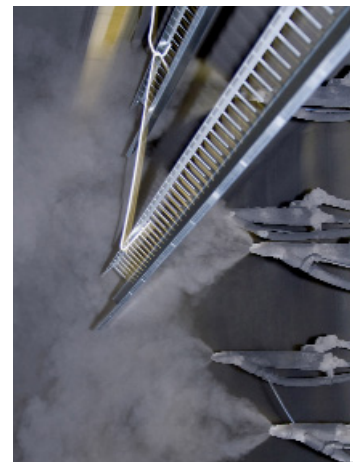
“The HDLV technology makes it easier to consistently get between 2 mils and 3 mils. The part passes through the cloud and the electrostatic nature attracts the powder to the part,” explains Goodson. “Before, powder would hit the part or blow by it.”

In its first full year in operation, the enhanced powder line saved Kysor//Warren approximately \$225,000. That figure includes the increased capacity through greater line density and the 25 percent in powder savings.

Reworking parts has also become easier. If a panel on a refrigeration case gets scratched, it has to be repainted immediately to ensure customer shipments are not delayed. Kysor//Warren can spray the part right in its “color change kitchen” then hang it in a gap on the line, which allows the part to be touched up and done in one-third of the time it would take if it had to run the entire line.

Goodson says the new powder system together with the entire lean process provides an unbeatable competitive advantage. “We now have one of the best lead times in the industry, as well as top-to-bottom quality from assembly to paint and everything in between.”

As for the paint line, Goodson sees a hot future. “Where we used to have gaps in the conveyor line, we now have parts. The plan is to produce and paint 1,000 cases per week. By combining other lean manufacturing principles with the Prodigy system we will have the capabilities to achieve that goal.”



The switch to dense-phase powder coating technology helped Kysor//Warren realize a staggering increase in production, from producing and coating approximately 375 refrigeration display cases per week to 565 cases per week.