

Replacing three powder lines with one boosts production for kitchen hardware supplier

When a North Carolina company replaces its three outdated powder lines with an automated powder system, it not only increases production by 25 percent, but also saves powder, reduces color-change time, and cuts energy use in half.

Grass America, armed with powder coating, has staged a silent revolution that has impacted kitchens across the nation. In 1979, the company, part of the international Wurth Group, with headquarters in Germany, began its US operations in Kernersville, N.C., functioning as a warehouse to service one of its major customers. A manufacturer of cold-rolled steel drawer slides and hinges, Grass America saw the vast market potential for its products. In 1985, the Kernersville plant began manufacturing state-side. This marked a departure from the kitchen hardware in use, which consisted of single runners in the center of the drawer or wood on the side. "Switching to steel was mainly functional," said the manufacturing manager of Grass America. "It works more smoothly for the end user and increases the longevity of the drawer. You can have it in there for 25 to 30 years and it will function just the same as the first day, where with wood that wouldn't be the case."

In addition to changing the materials, Grass America pioneered powder coating kitchen drawer slides and hinges, being the first in the US to use this finishing technology on these products. Powder coating gives the products a durable finish with a good appearance. Moreover, the coating imparts an unexpected benefit that no one notices as they are raid-

ing the cupboards or getting the silverware to set the table. The powder produces sound dampening that makes drawer operation quieter than other slides, said the manufacturing manager. This innovation has allowed Grass America to be invited into kitchens across America. The company supplies original equipment manufacturers primarily in the kitchen equipment industry. "We cycle test a complete drawer 100,000 cycles," said the manufacturing manager. "A cycle is open and close. For that, the powder couldn't wear off. We also check the sound level. It's very important

to the end user when they open and close the drawer. They don't want to hear anything really—they don't want to hear a lot of rackinging."

Currently, the Kernersville plant employs 250; 24 involved with finishing. In addition to coating, workers stamp and assemble product components. Over the course of 20 years, the company went from using one to



After workers load the drawer slides onto racks, the line takes the parts through a four-stage washer.

three finishing lines to powder coat its products. Two of the lines shared a washer, using separate tunnels to traverse the cleaning stage. The individual lines allowed the company to produce different products. The plant ran all three lines on the first shift, two on the second, and one on third. "We ended up with three lines mainly because of capacity," said the manufacturing manager.

Looking for a new line

As time passed, however, it became evident that the plant needed to upgrade its finishing system. "The oldest equipment was over 20 years old," said the manufacturing manager. "The whole system was outdated. There were newer technologies out there." To realize cost and labor savings, Grass America wanted to produce the same amount of product on a new line as it produced on its three lines.

To meet this goal, the company asked for quotes from three application

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equipment suppliers. It also adopted technologies and equipment that its related companies had been using in their European operations. The company ultimately decided on a booth that its Austrian counterpart was using on its line. In addition, Grass America used the same German manufacturer to install and supply the other line components.

To install the new system, the company took one line down to put the



Automatic guns on reciprocators powder coat these drawer slides.

new one in its place. The new line has a very small footprint compared with the other lines. The ovens are stacked on top of each other for energy efficiency. A general contractor did the installation, designing and fabricating line components in Germany and then transporting and installing the equipment in Kernersville. Grass America ordered the system in January 2005. The plant was finishing parts on July 25th. Once operational, workers tore out the two remaining lines.

Traveling the line of the 21st century

Six workers hang the parts on the line. Once loaded, the parts go through a four-stage spray washer consisting of a degreaser-phosphatizer followed by three city water rinses. Previously, the pretreatment system consisted of a separate degreasing and phosphatizing stage followed by one rinse. After exiting the washer, parts pass through a dry-off oven that runs at 302°F (150°C) and then a cooling zone. The dried parts then enter the air-conditioned powder room.

The environmental room houses the powder coating equipment that does more than the three previous systems combined. The booth houses 14 automatic guns on two reciprocators and a manual touch-up station. Workers enter a part item number to run a part specific coating program that includes set parameters, such as powder flow, pressure, and reciprocator speed and height. The booth programming capabilities have enabled Grass America to reduce its powder use. Currently, the company applies two colors: white and almond, depending on the cabinet or drawer color.

In addition to saving powder, the booth has allowed the plant to reduce color-change times. Previously, the company devoted 2½ hours to clean out a booth. Now, color changeover takes 10 minutes. The manufacturing manager attributes this incredible time savings to the booth automation and design. The booth has a cleaning program. The guns go into a certain position and retract automatically out of the

booth. Once outside, the guns are blown off by forced air from air knives. Powder injectors inside hoppers also get blown off with forced air. Tunnels in the booth floor let air-flow blow out excess powder. In addition, the booth design doesn't have many areas that allow powder accumulation. Workers access certain areas of the booth to squeegee down the walls. The booth material, a polymer-plastic, facilitates powder removal and reduces powder attraction. This wasn't the case with the previous steel powder booths. Workers would have to go into the booth and manually blow it down.

After powder coating, parts then pass through a gas-fired convection oven. The cure cycle is 12 minutes at 383°F (195°C). Next, the parts go through a cooling zone again. The cooling zones use forced air from outside the plant. This allows workers to adjust the temperature to retain warm air in the winter and remove excess heat during the summer months. After passing through the cooling zone, parts go through an automatic unload zone where they are dropped into metal bins that get pushed over to assembly.

Getting more with less

The new line has accomplished the goals set by Grass America—to do the work of its three previous lines. The new finishing line can process 100,000 parts ranging from 18 inches (450 millimeters [mm]) to 27½ inches (700 mm) long per 7½-hour shift. The line runs at 26¼ feet per minute (8 meters per minute). This increased line speed, combined with a new parts hanging method that has doubled line density, has allowed this powder system to replace the company's obsolete coating trinity.

Not only is the new line doing the work of the three outdated powder lines, it's also doing it more efficiently. The booth and guns spray 20 percent less powder to achieve good coverage. As a result, the company has experienced a significant material savings. Because the line processes two times the amount of parts in the same amount of time, the manufacturing manager said the line has cut energy



The booth automation and design enables workers to complete a color change in 10 minutes.

consumption by 50 percent. The booth also has allowed workers greater control of the coating process and finish quality. In addition, the booth positions Grass America to be able to transition into a lean manufacturing operation that can do shorter runs and more color changes to address customer demand, said the manufacturing manager.

Originally, the line was expected to handle the same capacity. It didn't. It has been able to handle an unexpected 25 percent increase in production without any issues. "We intended capacity to stay the same," said the manufacturing manager. "It went up. We're getting more and more orders, but the line is still able to handle it."

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Application equipment: *MS Powder Systems, Stallings, N.C. 704/882-3020. www.ms-powdersystems.com*

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