

Solutions

- **Plant efficiency solution**
 - Analyze plant equipment performance
- **Event data tracking**
 - Availability, Throughput and Quality
- **Eliminate waste**
 - Identify cause of scrap
 - Identify machine downtime
- **Improved data access**
 - Production data centralized
 - Managers have Web access to real-time production information

Results

- **Improved production**
 - Improved production by 30 percent in less than two years
- **Fast ROI**
 - Achieved ROI in less than 6 months
- **Reduced cycle time**
 - Reduced cycle time at bottleneck by 17 percent
- **Machine efficiency**
 - Increased machine efficiency by 23 percent in less than one year

SpaceKraft Improves Production 30 Percent with Plant Efficiency Solution

Start-up intermediate bulk container (IBC) manufacturing facility improves machine efficiency by 23 percent in less than one year



Background

Developed for food, chemical and solids manufacturers to replace the bulky 55-gallon drums commonly used to ship goods, a SpaceKraft IBC features three main components — an outer corrugated sleeve or shell, an inner film liner and a corrugated top cap.

SpaceKraft produces intermediate bulk containers through a patented process involving four main machine centers: corrugator; winder; saw; and endclosure.

The ultimate durability of a SpaceKraft IBC begins with the quality of the paper produced at the corrugator. The corrugator transforms paper into what is called singleface in preparation for winding. The winder then wraps six to ten plies of singleface, using a special glue, into a seamless sleeve. This construction eliminates the joint (a weak link in some containers), as well as the need for metal staples and wood components. Next, the saw slices the sleeve into two separate sleeves, which are then sent to the endclosure. The endclosure applies ends to the sleeve, as well as drills an access hole for product dispensing.

Challenge

“We were at the point in our operation where we were successfully producing quality products, yet we didn’t have a way to measure efficiency,” said Glen Lawson, SpaceKraft production manager. “I knew we needed a tool that could collect, store and analyze production data over time.”

Lawson’s search led him to Rockwell Software RSBizWare™ PlantMetrics™ software from Rockwell Automation. PlantMetrics, which is designed to help companies analyze the performance of plant equipment, would allow SpaceKraft to identify the actual cause of inefficiencies and machine downtime at the plant, and translate these improved efficiencies into profit.

PlantMetrics leverages a plant’s existing investments by capturing and using all of the valuable data generated by existing shop floor control systems. With detailed overall equipment efficiency (OEE) and event data, manufacturers can determine what machines, what parts and what shifts cause efficiency problems, and which three OEE components (availability, throughput, quality) they fall into.



Solution

At SpaceKraft, PlantMetrics collects event data such as machine start and stop times and number of total parts from the plant's controllers and stores them in a Microsoft SQL Server database. Via a standard Web browser on a client computer, managers can view productivity, quality and preventative maintenance reports on demand to support decisions about process improvements. And with easy access to historical data, they can identify trends, compare today's performance to the past and document improvements.

"PlantMetrics tracks the causes of downtime enabling us to attack those problems directly and improve uptime," said Lawson.

"However, the software's real value comes from its ability to collect data on the bottleneck. This allows us to pinpoint and address the specific processes within that machine center."

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Through starve/block analysis, managers can make incremental improvements to each step to remove the bottleneck. The result? SpaceKraft can monitor a part number and identify where the bottleneck moves to when running that specific part number.

SpaceKraft also evaluates production patterns over several months to note throughput trends. For example, managers recently discovered that the winder was highly productive in the morning, but slowed down in the afternoon.

"Once we spotted the trend using PlantMetrics, we looked deeper into the operation to determine the root cause of the slow down," said Lawson. "After consulting with the winder and maintenance team, we decided to allocate another operator to the machine center making it a three-man operation. This allowed us to increase productivity throughout the entire shift."

A key feature of PlantMetrics is its ability to capture and report any kind of factory floor event. SpaceKraft used this capability to record the running hours for each of the plant's 102 motors.

"Initially, maintenance intervals were based on estimated motor running hours," said Rodney Hansen, SpaceKraft maintenance supervisor. "Based on this data we might service a particular machine center every three months. However, even with regular maintenance we still had puzzling breakdowns, especially with a few critical machine centers. Each breakdown would cost us valuable production time."

Once PlantMetrics began collecting motor start and running time data together, the problem became evident.

SpaceKraft knew that the quality of its IBC corrugated board could be affected by many factors, including faulty equipment, inferior raw materials (paper and starch) and unstable process conditions.

With each IBC produced, the pressure and glue viscosity data is sent to the PlantMetrics system. This helps SpaceKraft to determine when a sleeve is within tolerance and also assigns a date and time stamp for each.

"From a quality perspective, PlantMetrics is a great tool," states Lawson. "Ultimately, it allows us to identify the right production parameters in order to manufacture to the specifications we desire. By examining the quality report, we can quickly identify when a sleeve goes out of tolerance and scrap it if necessary."

Results

"From an historical standpoint, our plant now has the capability of producing considerably more on a per shift basis than in the past," Lawson stated. "With the help of PlantMetrics, we've been able to boost total output by 30 percent. And we are accomplishing this feat without additional capital expenditures or increases in labor."

SpaceKraft's ability to pinpoint problem areas in each work cell and make improvements to machine availability, throughput and quality has led to an increase in machine efficiency of more than 23 percent in less than one year. In addition, it has led to a 17 percent reduction in cycle time in the enclosure machine center.

SpaceKraft also found that employees have embraced PlantMetrics as a new way to measure production improvements.

"PlantMetrics has become more than just an OEE solution, said Lawson. "We don't just use it for efficiency monitoring purposes, but also as a tool to determine how we run our entire plant everyday. In the future, we expect PlantMetrics will provide us with new insights on how to expand our profitability."