Growth Business

Powder management system speeds colour change for agricultural equipment maker

"The agriculture industry has really blossomed," says Gordon Wiwchar, manager of manufacturing engineering at agricultural equipment maker Case New Holland, Saskatoon, SK. The rising demand for corn-based ethanol and recent food shortages in some areas of the world has driven up the price for many crops. This in turn has led to increased demand for the kind of equipment that Case New Holland manufactures, and challenges for Wiwchar and his staff as they try and find efficiencies to increase the output at their facility.

Case New Holland makes large equipment for planting, seeding, tillage and harvest. Some of the tillage equipment the company makes is up to 70 ft wide, with individual parts up to 35 ft long before the unit is assembled. Annual output at the Saskatoon plant is approximately 7500 units. To someone in the automotive industry, that may not seem like much. However, Wiwchar points out that there is much more complexity involved. "If you get into an automotive plant, they may have two or three models and there's very little variation between them," he says. "Whereas with us, if you go from a header to a corn planter to an aircart, there's big variation."

Over the last few years, the amount and variety of products produced at CNH's Saskatoon facility has increased, necessitating increased flexibility in its manufacturing capabilities as well as its finishing lines. The facility is divided into three main areas: an east plant, a west plant and a fabrication area. Both the east plant and the west plant have a continuous flow powder line with automatic application. The finishing line starts with a four-stage pretreatment system of an alkaline cleaner/degreaser followed by a rinse, phosphate stage and then a freshwater rinse. The parts on the line continue through a dryoff stage, automatic powder application in a booth with 20 guns, through the curing oven and then to the cool down stage.

Prior to 2002, each of the automatic powder lines had a single booth that would alternate only two different colours. Up to that time, a colour change meant interrupting the flow of the line for up to two and a half hours to change the guns, hoses and collector system and thoroughly clean the booth to ensure there was no cross contamination with the new colour. The job usually involved five to six people and ate up a minimum of 12 to 15 man hours, says Wiwchar.

Then in 2002, another Case New Holland plant in the US manufacturing combines and headers shut down. The Saskatoon facility got the contract for the headers. "That introduced another colour and additional volumes for us. So in order to accommodate this, we added a second powder booth to the east line," explains Wiwchar. The addition of the second booth meant that they only had to leave a 15-minute gap in the line to move one booth off line and put the other one on line using a series of tracks on the floor. While this system eliminated the long interruption in the flow of the line, it still required the 12 to 15 man hours of work to clean the second booth while it was not in use.

Colour change time has been reduced on the continuous flow powder line at agricultural equipment maker Case New Holland.

Then in October of 2006, a new challenge arose. There was an announcement about the potential closure of a sister plant, and that meant that the Saskatoon plant would again have to reconfigure its production facilities to accommodate a new product mix. Some of the product currently being manufactured in the west plant was to be moved to the east plant. "With the addition of this extra product and having to move stuff around, we would have had to introduce a fourth

The Chameleon powder managemenr system from ITW Gema.

colour into our east line that we didn't ever use there," says Wiwchar. The situation was a classic example of growing pains, in that the additional product was not quite enough to justify the addition of a third shift at that point. However, maintaining the two booths under the current system would have been highly inefficient. Without enough work to add a third shift, it was necessary to pay existing staff overtime to clean the booths, a less than desirable option. The problem boiled down to how to accomplish the colour change in the same amount of time and eliminate the 12 to 15 man hours required for booth maintenance on each changeover.

That's when ITW Gema, Indianapolis, IN, came into the picture with the Chameleon Colour Management System. Wiwchar had heard Gema's claim that its system would allow the east plant paint line to accomplish the colour change in about 20 minutes, and do so without taking the booth off line, either. Sceptical, he sent a project manager and the supervisor of the east plant paint line to visit a few other manufacturing facilities where the Gema system was installed to verify the claims. When the two returned impressed with what they saw, he decided to upgrade much of his equipment to the ITW equipment in the summer of 2007.

Before switching to the Chameleon system, CNH staff had to take all the lines off individually to blow them and other components out manually. Wiwchar was able to eliminate a great deal of this tedious cleaning work thanks to the Chameleon's programmable logic controller (PLC). The PLC controls the internal cleaning of suction tubes, injectors, powder hoses and spray guns. The powder management centre also initiates the external cleaning of the powder guns, says Greg Taylor, ITW Gema's regional manager for Canada. Wiwchar also replaced the 20 guns with Gema automatic Optiflex guns and new light curtains for part detection. Gema also installed new XT09 positioners and digitally controlled ZA02 reciprocators that automatically adjust their speed and stroke to any changes in line speed.

One of the only things that remain from the original configuration is the original booths. A limited amount of time and money to accomplish the changeover meant that Wiwchar was not able to do everything he wanted at once. Under the old system, all four spray booths in the facility had a powder reclaim system. "In order to accomplish this changeover with the time we had and the budget, we went to a spray to waste system," he says. "Our next step is to go and upgrade that booth to a reclaim booth, but that's in the future."

While Wiwchar admits that for the time being the company might be spending a bit more on material costs, Case New Holland is more than making up for that expense through savings in labour costs thanks to the new system. In fact, the change was an important factor in helping the company increase its overall productivity enough that it has recently started staffing up a third shift to deal with increases in volume, he says. CM