MAP
QUALITY CONTROL

CASE STUDY

Sensitive quality products require quality equipment

Synlait Milk
Synlait Milk is an innovative dairy processing company based in Canterbury, New Zealand. Its state-of-the-art facility manufactures a range of nutritional products, including infant formula powders. Indeed, the company has one of the largest integrated infant formula sites in the world, offering customers complete supply-chain integrity from 'behind the farm gate' to the consumer.

Milk powder products, such as high specification whole milk powder and infant formula base powder, are often packed into 25 kg bags. In addition, Synlait's consumer packaging facility produces infant formula in retail ready cans. Most of the company's products are exported to customers around the world.

The company is expanding: in financial year 2016 it produced almost 16,000 tonnes of canned infant formula, an almost fourfold increase on the previous year.

The milk powder process
The milk powders are produced through a spray drying process on three large scale spray dryers, each producing 8.5 - 10.5 metric tonnes (MT) of powder / hour. Milk powders packed into 25 kg bags are packaged under a modified atmosphere to increase shelf life and maintain appearance. "For the three spray dryer lines we have a pre-gassing chamber above the filler where nitrogen is used to lower oxygen levels", explains Tom Atkins, a Senior Technologist at Synlait.

"Then CO_2 is used during the bag-filling process to help maintain suitably low oxygen levels."The consumer packaging line is more sophisticated, with defined mixtures of CO_2 and N_2 being used in both pre-gassing and filling.

Tom Atkins, Senior Technologist at Synlait

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Synlait case study, November 2016

The challenge

"It is very important for us to control not only the residual oxygen [RO] level, but also the amount of CO_2 in the can to ensure that the product maintains premium appearance throughout the supply chain," says Tom. Until recently, quality assurance on the MAP lines was achieved by using RO meters alone. "However, these meters are capable of measuring RO levels only, and not levels of other gases," Tom says. Drawing appropriate samples from packages was challenging with RO meters, because the CO_2 becomes absorbed into the powder and creates a vacuum. "The vacuum generated by absorption of the CO_2 into the powder was so great that our existing RO meters struggled to draw a representative sample of the modified atmosphere," explains Tom. "Thus air was getting into the testing sample and generating false positives – high RO readings – which could potentially lead to products being incorrectly rejected."

The solution

To solve this problem Synlait turned to the MAP instrument specialist MOCON Europe, part of MOCON Inc. The solution was provided by MOCON Europe's Dansensor® CheckMate 3 headspace gas analyzer. This is a benchtop instrument that allows highly accurate headspace oxygen analysis, or combined O_2/CO_2 analysis. "The instrument is very simple to use – operators can be trained in 5-10 minutes," Tom says. "The display panel is very intuitive and logical, and feedback from staff has been very positive." The company now has Dansensor CheckMate 3 analyzers on two of the three large scale spray dryers, and on the consumer packaging line. "We now have increased our confidence in the accuracy of RO levels for products in bulk packaging," Tom notes.

The company now has Dansensor CheckMate 3 analyzers on two of the three large scale spray dryers, and on the consumer packaging line. "We now have increased our confidence in the accuracy of RO levels for products in bulk packaging," Tom notes. "Our customers provide one of the most sensitive products in the world – infant formula – and our focus on making the most from milk means that we're focused on producing the highest quality product we can. Improving the accuracy of our RO data on finished products directly supports this focus."

Tom and his colleagues have been impressed with the service provided by MOCON Europe. "Technical support and willingness to go the extra mile by coming out to our site and working with us to demonstrate their prototype in a troubleshooting situation was outstanding," says Tom. "This encouraged further investment in two more Dansensor CheckMate 3 instruments. The knowledge that we were working with a well-regarded company and excellent New Zealand agent gave us complete confidence in MOCON Europe's solutions."

Synlait Milk's Dunsandel site in Canterbury, New Zealand

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