

SPECIAL FOCUS

Darren Parris and Mark Cornwell of the Milling and Grain team travelled to Cremona, Italy, to visit OCRIM's headquarters to learn about their new innovative system – the Multifunction Grain Analyser (OnlineMGA).

Chief of OCRIM's electrical department, Engineer Paolo Molinari took them on a tour of the factory and shared information on the OnlineMGA.

The OCRIM research and development team obviously realise that there is a market need for having control and management over the milling process. The key objective of OnlineMGA is to provide significantly improved management throughout the process, in particular giving real time data on the levels of moisture and protein within the wheat.

Having real time control of the production process means that the wheat's chemical parameters can be managed throughout the conditioning and cleaning phases making this an important aspect of this system.

Key objectives

Controlling the protein and moisture levels is beneficial when milling because it allows the production of flour that has constant timing characteristics. While at the same time the control of wheat moisture at the various phases of water addition is of fundamental importance for the conditioning process.

The device itself is compact enough that it can be inserted at several critical points throughout the milling process without occupying much space. This automated management system

Online Multi-Grain Analyser

This innovative product has been developed using VIS-NIR technology, based on near infrared Spectroscopy. The equipment targets the contained substances with a beam of light that has a defined frequency range. As a result a different absorption spectrum, composed of various wavelengths is obtained.

This spectroscopic process provides accurate readings in real-time, this is possible because it acts directly on the water and protein molecules within the wheat.

Moisture and protein analysis

According to OCRIM the most innovative aspect of the OnlineMGA is the continuous retroactive adjustment that can be carried out on the amount of water added in both dampening phases. This feedback throughout the first and second conditioning phases produces a value of the percentage of moisture required, constant in time, of the wheat that is used in the milling process.

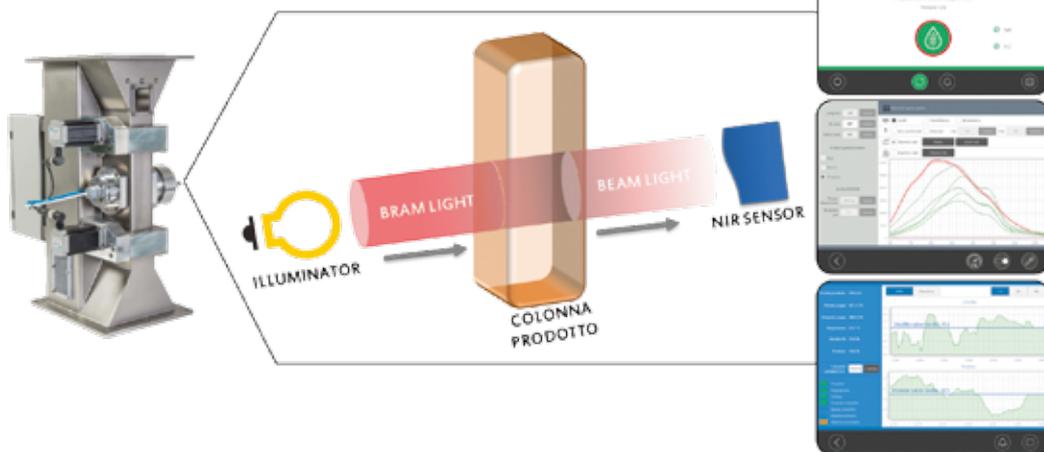
The device contains two step-by-step motors, one of which has a function to regulate product moving past the camera, this must remain constant. The second motor switches off the entire analysis camera periodically; it needs to be reset every 15 and 30 minutes. This is done to make sure the machine is empty, when the device detects it is empty it will produce a receipt.

Paolo explained that when light is put through the column of the machine, a shadow is obtained. The curve of this shadow goes into an automated system that matches the recording against a shadow with the same characteristics by searching through a

dedicated database. This is how the percentage of humidity and protein in the product is derived.

OnlineMGA can also be used during the raw material reception of the plant. When positioned before the storage stage, the device can measure the moisture of the whole amount of the product, allowing for the immediate evaluation of all incoming cereals.

All information on parameters measured from delivery to final product can be recorded and combined which in turn guarantees excellent traceability.



provides a continuous and constant analysis of cereals that enables the control of protein and moisture values. "This machine was installed online, it will mean that product incoming and outgoing will not have its flow disrupted", says Mr Molinari.

Technology

"The main problem that we have met during our experience is that of measuring moisture in the second tempering stage, this is due to the naturally occurring tendency for wheat grain to be changing. This said change makes it difficult to analyse, but with NIR technology we have solved this problem" explains Paolo.

The measurement of the cereal's protein value can be performed at the same time as the wheat moisture analysis, using the piece of equipment.

Production

OnlineMGA was first on show at IPACK IMA in May this year. OCRIM have already carried out all the tests in order to prove the correct operation of the machine, and it is now available.

Paolo suggested that the main way this system will lead to cutting costs is by means of ensuring that users are paying for grain rather than water upon product reception into the plant.