

Abstract

The tall, white silos of a mixed feed factory stand out amidst the plains of Vechta County, Germany. The family-owned Austing feed plant has been a name synonymous with quality for generations of farmers in the region.

Austing trusts in-line process control with the industrial NIR-Online spectrometers.



Figure 1: Austing feed plant in Damme, Vechta County

Introduction

The fledgling company began as a windmill, founded in 1911 by Bernhard gr. Austing. Within three generations, it transformed into the modern feed factory pictured above, predominately serving as a contract manufacturer for the agricultural cooperative society Damme. Presently, the company produces around 1,000 tons of pig, poultry, and cattle feed. Approximately 90% of the plant's output is pig feed, a reflection of high-volume pig-breeding in the Lower Saxony region of Damme.

The agricultural cooperative society Damme provides Austing with raw materials such as grains, protein feed, starch feed, minerals and premixes needed for the mixed feed production. The society also specifies over 200 different mixed feed recipes which Austing processes.

1. Technical innovation in demand

“The big advantage of the cooperation with the agricultural cooperative society Damme is that we have continual incoming orders without need to care about purchases or product sales,” emphasizes Bernhard gr. Austing, grandson of the founder, who took over the company management in 1982. Consequently, Austing has been able to concentrate solely on production and investigating avenues for technical improvements and innovation, with the goals of increased manufacturing efficiency and the ability to supply the agricultural cooperative society Damme with mixed feed of uncompromised quality.

Integration, mechanization and automation within the company are of core interest. Daily workflow spans the

receipt of approximately 40 truckloads of raw material which must be conveyed, stored, measured and fed into the process line where components are mixed, heated, sometimes pelleted, and ultimately bagged and loaded onto out-going silo trucks. The current level of automation at Austing enables an annual output of at least 280,000 tons to be achieved by only 20 employees covering both production and administrative roles. Controlled order processing ensures that the ordered goods leave the factory in time.

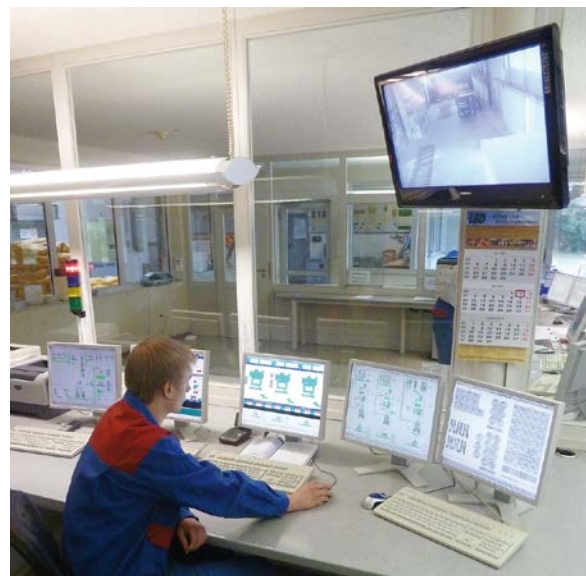


Figure 2: Austing process control room

2. Process monitoring and in-line control

With an eye on quality control, Austing implemented state-of-the-art NIR-Online industrial spectrometers to enable constant monitoring and in-line control at their facility. NIR-Online GmbH has been recognized as a supplier of innovative process control sensors for a decade.

Austing mixed feed factory purchased the NIR-Online sensors within the context of an economic development program organized by the University of Bremen to improve energy efficiency. „Nowadays mixed feed is produced according to modern scientific knowledge. [Blends may] consist of up to 15 components according to the needs and performance requirements of the farm animal,” explains Bernhard gr. Austing, chief executive officer of the company. “Only if the blends correspond to the recipe specifications, can we guarantee an optimal feeding to the animals.”

Although Austing had practiced a comprehensive quality control system before implementing NIR-Online sensors, there was room for optimization. Managing director Andreas Robke recalls: “Previously, we took select samples out of in-process blends which then had to be evaluated in an external laboratory and with



State of the art technology to secure quality NIR-Online for mixed feed production processes

NIR-Online® Austing feed plant controls production in-line with NIR-Online sensor technology

an extensive time delay. With the NIR-Online technique you realize a in-line transparency of the composition of the products.” Austing installed one industrial spectrometer at the raw material intake, and a second after the blending and pelleting process. Measured product parameters include moisture content, oil, ash, starch and protein.



Figure 3: View of raw materials sorting system

Bypass pipes engineered with small windows have been placed at predefined locations within the Austing process line in order to capture these critical product attributes. The windows serve as the interface between the NIR-Online sensor and a continuous stream of raw materials, blends or pellets. Near-infrared (NIR) light emitted from the sensors irradiates products passing the windows; the interaction of light with these materials results in absorption by the sample which is characteristic of its composition. Some of the irradiated light is reflected back to the diode array detector of the sensor, carrying with it the absorption information necessary to achieve quantification of the product attributes. With measurements collected every 30 milliseconds, over 100,000 measurement results can be used to monitor each charge of the process line. Data management is handled within the process software “SX-Center.” The software is integrated into the control department of the mixed feed factory. Measurement results are displayed in process charts, enabling employees to diagnose process variations in in-line.



Figure 4: the NIR-Online sensor ensures timely control of the mixing and pelleting processes.

3. Traceability

NIR-Online measurements offer Austing many advantages. “This enables us to test permanently, if our feed mixes correspond to the ingredient specifications.” explains Andreas Robke. “If the measurements result in deviations from specifications, we are able to analyze and adjust them accordingly. This guarantees constant product quality of the feed sorts.”

In addition, the software automatically generates a production journal which documents all operations and results, providing internal traceability, as well as the ability to quickly respond to queries by customers. Before the production journal, customer queries were addressed by pulling vacuum-packed retained samples from a production inventory – a slow and resource-consuming activity which often was unable to fully address any inquiry.



Figure 5: vacuum packaging of the storage samples

Most importantly, the NIR-Online technique enables the mixed feed factory in Damme to provide goods of consistent quality while maintaining high production efficiency. “Due to the fact that we ultimately control the quality parameters of the products, we are able to take corrective action if measured values do not meet specifications,” explains managing director Andreas Robke.



Figure 6: Effective mixed feed logistic through route planning



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Achieving target product attributes in feed is essential for the health and growth of the animals consuming the feed products, and ultimately, the human population consuming the meat, milk products or eggs of those animals. When questioned on the meaning of optimal feed quality, Bernhard g. Austing emphasizes: „High quality mixed feed is an important element in the supply chain of safe and healthy food.”

4. Contacts

For more detailed information please contact your local BUCHI representative or visit the BUCHI website: www.buchi.com/nir-online .