In the mix: ABB's Manufacturing Execution Solution

Drink maker Wander AG uses MES for increased efficiencies

Wander AG, maker of the globally popular Ovaltine and Caotina chocolate malt drinks, achieves increased efficiency and flexibility by introducing ABB's Manufacturing Execution Solution (MES) in production processes.

Ovaltine and Caotina not only taste good — they have become an essential part of breakfast for many children all over the world. Developed more than 100 years ago, Ovaltine is a nourishing food beverage for children with its vitamin-rich properties from malt extract, milk and cocoa. It is recognized as an ideal combination of essential nutrients in a delicious, satisfying warm drink.

Wander's plant in Neuenegg, Switzerland, one of its oldest Ovaltine production sites, faced the challenge of increasing demand for capacity and flexibility in a production facility whose structure has grown over many decades. Thus, Wander embarked on a project to modernize and streamline its production process to realize improved efficiency and flexibility.

The production of the Ovaltine and Caotina drink mixes has long been controlled by ABB's automation platform System 800xA. The need to increase production efficiency and flexibility led Wander to implement a Manufacturing Execution System (MES). With the introduction of ABB's MES, part of the ABB Ability™ Manufacturing Operations Management (MOM) offering, Wander now also has complete horizontal and vertical integration — from the delivery of raw materials, to production, to finished products, and from Enterprise Resource Planning (ERP) system to plant floor. The integration of the business system layer with the control system layer enables the synchronization of the production processes, transparency of all plant activities, as well as production improvement and optimization.

Benefits: Enabling productivity, quality and continuous improvement

The implementation of the MES system was part of a larger modernization project that also included changes in the physical building and higher level of automation in the logistics operations (e.g., connecting the high rack warehouse to the production and automated guided vehicles). The major challenge for the parties involved was to maintain the production and logistics operations without major interruptions. The constant changes through the individual projects required optimal coordination and fine-tuning. The high standards of product quality, hygiene and service delivery also had to be adhered to at all times.

New silos for raw and bulk products play a key role for optimal production processes. It is now possible to control material flows and to track production processes, thanks to an accurate and automatic data acquisition of the MES. Manual and paper-based pre-production steps, such as pre-weighing of raw material, are now also supported by the system. Operators are guided through the weighing using ergonomic workplaces and barcode scanners, thereby ensuring an accurate and efficient process at all times.

The new system now controls the work order picklists of the individual products. When the production order is downloaded from the ERP system, the MES system starts the batches and calls the necessary raw material, which is delivered via a driverless fork lift (AGV) from the high rack warehouse. Another part of the raw materials comes from the day silos. The required ingredients in the dry mix are then combined, mixed dry or wet depending on the recipe, and then dried, granulated and bottled as a dry mixture. The system thus controls the overall formulation — from the weighing of raw materials to the actual mixing process, including automatic dosing of all components supplied. With automation, error rates are reduced as the system instantly detects and interrupts the weighing or mixing process when any deviations are detected.

Other improvements that were realized with the new system include raw material handling. Before the project, whey powder and cocoa were delivered in 25kg bags. Today, these ingredients are stored in silos with a daily capacity of 5,000kg, which are filled by big bags. The changed formats mean savings for Wander in terms of filling and raw materials input, as well as a significant reduction of handling. A key functionality of the MES system is the seamless and complete traceability of all materials, equipment and persons involved in the production process. It is now possible to instantly view the genealogy of the products, all the way down to the mixing layers of powders in the silos.

Inventory is another area that has seen improvements. As material usage is booked back in to ERP as it is consumed, inventory is always up-to-date and correct. This enables timely material re-ordering and avoids corrective actions and unplanned downtime.

Convincing integrated solution
The decision to go with ABB was based on a good experience with the existing 800xA process control system, and ABB's extensive know-how of fully integrated solutions, the availability of proven and tested applications and a good cost-performance ratio which results in early payback and sustainable ROI. "Not only were the

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Teamwork under time pressure

He continued, "The collaboration of Wander and ABB was very good and efficient. Because of the complexity of the project and time pressure, there were some predictable difficult stages. However, all were addressed professionally and effectively." Additionally, production had to continue during the restructuring. The well-synchronized teams of Wander AG and ABB met all challenges. Together, we were able to develop constructive solutions," he said.

Capabilities

ABB's Enterprise Connectivity Solution as part of the MES offering provides the complete solution for seamless manufacturing and business processes integration, enabling true interoperability among all entities involved in the production process. The main MES capabilities deployed at Wander are:

Production order management:
- Bi-directional integration of ERP to automatically download orders from ERP to MES, and report back relevant information
- Comprehensive routing (workflow)
- Overview of all production orders and statuses

Material management:
- Track-and-trace provides complete traceability of production orders, materials, batch, lots, equipment and personnel, leading to improved utilization and regulatory compliance.
- Weigh and dispense accuracy is improved by guiding operators with intuitive, user-friendly instructions on displays, supporting compliance and security procedures to ensure that correct material and quantity is dispensed by verification checks on materials, containers and scales through barcode technology.
- Wireless Barcode Scanning leads the operator through all relevant steps and captures material movement.

Warehouse management:
- Container management is improved through the Tote bins used for raw material; premix or finished material are managed including information regarding production order, lot, amount, fill date/time, cleaning, etc. which is available at all times.
- Silo levels and refilling are kept within defined ranges and material lots and mixing levels are continuously supervised to enable layered dispensing.

Other results

Manual efforts were significantly reduced in the following areas:
- Raw material handling
- Weighing and material preparation
- Reporting back to ERP
- Improvement of quality and reduction of errors

New production processes were made possible with raw material and bulk silos that track lots (layered dispensing).

In the area of supervision and control of manual activities, Wander has realized less errors and reduced scrap. Material management is also improved as materials are booked back in ERP when it is consumed. This means inventory is always up-to-date and correct, enabling timely material ordering, corrective actions and less downtime.