The new dairy factory at the Romanian town of Popesti near Bucharest

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Integrated automation as the basis for quality management

The Israeli dairy group Tnuva has commissioned GEA Tuchenhagen Dairy Systems (GEA TDS) to build a new dairy factory from scratch at the Romanian town of Popesti Leordeni, near Bucharest. At the plant operator's explicit request, ProLeiT's Plant iT process control system will be used for the complete automation of this new dairy factory. The absolute openness of the system architecture ensures a fast and problem-free production start and opens up the possibility of expanding the plant in the future. Integrated production data acquisition forms an essential basis for quality management and product traceability.

Even the milk processing business is becoming increasingly global, with increased demands on system vendors as a result. The latest example is the Israeli dairy group Tnuva, who decided to build a complete new plant at a new site in Romania. Tnuva, one of the world's leading manufacturers of cottage cheese and strongly represented in kosher milk products in the USA, wanted to use this plant to ensure access to the rapidly growing market in Romania. This plant currently processes various fresh dairy products like milk, yoghurt, fermented drinks, cottage cheese, puddings and flavoured drinks. It was decisive for the plant operating company to choose an automation solution that had proved itself not only at many reference plants in Europe's largest dairy factories, but also in particular offers the largest possible flexibility for production. Tnuva also required integrated quality management with reliable batch tracking and a sophisticated reporting system in order to satisfy the strict European regulations and standards for milk production. This is why Tnuva chose ProLeiT's Plant iT process control system.

One plant – one integrated system

From milk acceptance to the filling plant – Plant iT is the integrated automation solution for the entire dairy process across all process stages. The Plant iT process control system consists of the following software modules

- Plant Direct iT as PLC-based process control system
- Plant Liqu iT for technology-oriented dairy recipe control
- Plant Aquis iT for production data management.

All system modules have a central engineering environment with a shared data pool and an integrated parameterization user interface. In this environment, all system and configuration data can be accessed via a tree structure similar to Windows Explorer. User administration, message profiles, pools of graphic elements for the visualization, etc. are also available, as is the complete plant structure down to the individual actuators and sensors that can be parameterized using cascadable location keys.

Even complete sequences within the process can also be parameterized to a large extent. This means parameterization has largely replaced programming. Wolfgang Teuscher, methods engineer at GEA Tuchenhagen, also sees the decisive advantage of Plant iT here: "Thanks to the parameterization capabilities of the ProLeiT system, one does not need a programmer for every change."

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ProLeiT at Anuga FoodTec

Cross-border, cross-sector and process-oriented. These are the keywords of the world's most important trade fair for food & drink technology. They also genuinely describe ProLeiT and its Plant iT process control system – with all its sophisticated features tailored to meet the specific technological requirements of today's food industry. Process control technology. MES included!

ProLeiT is presenting first application examples of its most recent system generation: For Version V 8, process-oriented materials management has been further developed into an independent software module referred to as Plant iT material. The process-oriented mapping of the storage structure of an entire production plant enables precise stock control of all raw materials and supplies, including consistent batch tracking.

At the ProLeiT booth, visitors are provided with the opportunity of taking a look behind the scenes of ultra-modern food technology:

The green field project only recently put into operation in England is a prime example of an overall process control solution with both horizontal and vertical integration.

The entire process, including the milk receiving station, the operating room with its flash pasteurizers and even the bottling systems, is smoothly controlled based on a comprehensive automation concept. Process control and Production Data Acquisition (PDA), the processing of incoming orders in SAP, process-oriented materials management for precise batch tracking and detailed reporting are included in the scope of delivery.

As an ultramodern example for the production of non-alcoholic drinks, the water treatment and syrup mixing plant of Mineral-Heilquellen Ensinger based on Plant Batch iT is being presented at the ProLeiT booth as well. The sophisticated functions of this automation concept control the entire recipe and order management process, including residuals processing, and also material management with a container identification system based on WLAN scanners and batch tracking.

Furthermore, visitors can admire a batch system for drier handling with typical functionality required in bakeries or for the production of food additives.

The range of exhibits at the booth is complemented by PDA (Production Data Acquisition) application examples, including the identification of raw materials and supplies, and also by state-of-the-art solutions for plant efficiency evaluation based on OEE (Overall Equipment Effectiveness) figures for filling and packaging systems. For this ever topical field, we not only present solution approaches, but also provide specific savings potential based on energy data acquisition and load management.

Hall 8.1 – booth D050

High flexibility for product and process parameters

In this ultra high-performance system for recipe and order management, the plant, process and recipe modeling can be conducted strictly in accordance with ISA 88 or using simplified models derived from this.

This enables recipe modifications, recipes for new products and process adaptations to be activated in an uncomplicated way using the appropriate parameterization in the article database. This article database and simple parameterization allows the technologist to create all parameters for new products, to eliminate old products that are no longer marketed or, obviously, modify recipes and process parameters themselves without needing to change the controllers or the programming.

Next to fresh dairy products, yoghurt, puddings and flavoured drinks the plant produces cottage cheese, too

Optimized automation for cottage cheese production

The process control system integrates extensions with batch functionality for the production of Tnuva cottage cheese. An operator station in the cheese production provides the operating personnel with special recipe instructions for the addition of hand-weighed components in powder form. The process control system activates the next process step only when these recipe instructions have been executed – and acknowledged.

Another special feature of the automation solution is the control and monitoring of the cutting unit for the curd. This requires not only the acquisition of the end positions of the motor-driven oscillating cutting device, but the control system must also maintain a defined cutting regime. This also maps and optimizes the automation of the curd manufacturing based on Tnuva know-how.

Quality management and automated reports

Plant Acquis iT implements the production data management, which provides an excellent data basis for quality management together with comprehensive automatic acquisition of all production data, step logs for the individual articles and also manually acquired data (for example from the laboratory). All batch data is available in real time.

The highly adaptable report forms allow each process step to be analyzed and provides complete transparency as to which product was processed when and in which plant section. These reports also show all setpoints and actual values, and therefore render any deviations immediately visible. This allows, for example, not only for the quick and easy determination of any losses, but also determination of which plant sections caused them. In this way, Tnuva matches the fat content of the delivered raw milk with the fat content of the product and the calculated fat balance. Losses in the individual production stages become visible and can be minimized in a targeted way.

Roland Riedl, Head of the ProLeiT dairy section

Utility management on Plant iT

Tnuva also uses the Plant iT functionalities for energy and utility management. The plant operator places great importance on using the same process control system for building automation and supply engineering and for the acquisition of consumption data for water, steam and electricity. This was implemented by an Israeli engineering company on the basis of ProLeiT's Plant iT. The Plant iT messenger integrates a notification system, which when necessary transfers special warning notifications or error messages via various telecommunication routes to the relevant personnel. For example, in case of a fault, the personnel responsible for maintaining the building automation who are not normally present on-site can be informed quickly and, in addition to the fault message, provided with information about any spare parts required.

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