

All Systems Go at Molke 5

ProLeiT AG has been responsible for the process control system at Sachsenmilch Leppersdorf GmbH for more than twenty years. In preparation for entry of the Theo Müller Group into the world of baby food production, the German software manufacturer from Herzogenaurach established the automation environment for 'Infantose' production while once again living up to its reputation as a flexible and reliable partner.

Taken over by the Theo Müller Group in 1994, Sachsenmilch Leppersdorf GmbH has since been gradually transformed into one of the largest and most advanced dairies in Europe. It now employs roughly 2,500 people at this production facility alone. The milk delivered to the site – approximately 1.8 billion kg annually – is used to manufacture an array of products within a complex, partially automated plant. Throughout five production sectors, milk is processed to create basic and fresh products, cheese and powder.

On board from the start: ProLeiT AG. The business headquartered in the southern German town of Herzogenaurach was, at the time of the takeover by the Müller Group, commissioned to automate processes for the new systems at the facility. In the second stage of expansion five years later, the foundations were finally laid for the intensive cooperation over the past two decades. In 1994, ProLeiT implemented a client server architecture, based on the 'in-house operating system' OSNT, and Ethernet as the communication link between controllers and the operating station – a full-scale system for process automation, including complete recording of all the operating data.

Over the following years, the system was constantly added to as well as updated and upgraded in lockstep with plant expansion. From a hardware point of view, all plant expansions since 1999 have incorporated the latest Simatic S7 controllers; in addition to the existing OSNT, the current ProLeiT process control system Plant iT has been installed. The control system newly implemented by ProLeiT has since been at the heart of all further plant developments carried out by Sachsenmilch.

ProLeiT was also commissioned to execute process automation for the current project – entry into the manufacturing of raw products for baby food along with the corresponding expansion of the existing plants and machinery.

Increased requirements

'Molke 5' stands for the manufacture of dry mix lactose. The introduction of new technology obviously sees significantly increased requirements being placed, on the one hand, on the quality of products right up to the end product and, on the other hand, on the complete verification of processes, including stability and standardisation. Performance is verified through a series of process and cleaning validations and is subject to a change process. The demands placed on the plants in terms of hygiene and cleanliness are higher and the inspection and maintenance intervals are much shorter. This holistic concept is reinforced through strict access restrictions and a zonal concept that makes multiple relocation necessary depending on the risk area.

A lack of existing space to support expansion meant the construction of a new factory building was essential for the project to succeed. An even more important factor for implementing the control system was, however, the fact that Sachsenmilch had chosen a plant concept for 'Molke 5' that differed substantially from the rest of the manufacturing processes. "The reason

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behind this was that the company expected a higher rate of lactose production through the new method," explains Thomas Kirner, who, as a dairy team manager, was in charge of the overall project 'Molke 5' at ProLeiT. "From a purely technical perspective, the new concept does not differ greatly from the old one, since: the raw material 'whey' still undergoes filtration, a series



Factory site of Sachsenmilch

application profile

Sachsenmilch

of evaporation processes and finally a drying process." Sachsenmilch's name for the lactose end product is 'Infantose' (lactose for use in baby food). The decision to again commission ProLeiT with automation of the system-relevant work packages was taken at the end of 2014; and work on the project commenced in January 2015.

Project planning phase

For ProLeiT, the project planning phase was initially all about understanding the requirements of the new concept and how to integrate the respective manufacturing processes into the automation solution. 'Molke 5' was then divided into ten to fifteen sub-projects or individual projects that basically corresponded to the number of part systems integrated in the process sequence. However, since certain areas of the conceptual design had to be adapted to new knowledge gained during the work process, some aspects of the sub-projects did not actually become clear until further into the project phase. Besides being responsible for the automation of 'Infantose' production, ProLeiT was also concerned with controlling the supply of media – including the distribution of (ice) water as well as the control of refrigerating and compressed air machines. "Pretty much straightforward processes for us," says Kirner, "but the tight schedule for putting the plans into practice demanded a high level of work intensity."

Realization

The project was brought to fruition in the following months and is based on the Plant iT version 7.12 currently running at the plant. The already existing Microsoft Windows servers 2008 or SQL servers 2008 could be used as the software basis for the three servers employed within the facility. On the hardware side, ten Simatic-S7-416-3 controllers were used for the 'Molke 5' project. Furthermore, ProLeiT was also responsible for the server settings and for cross coupling to other systems "to ensure the controllers communicate with each other". An important factor for overall project planning and implementation: "The enormous size of the plant alone meant we had to deal with a high degree of integration and interaction with corresponding



The 'Molke 5' building

levels of complexity. To ensure ongoing operation and productivity of the facility, we had to be extremely careful when introducing changes to existing processes!"

Necessary changes to the plans and constructional implementation resulting from optimising and expanding the actual plant concept led to a few delays and we were thus not able to start implementing the software at the plant until January 2016. After carrying out successful hardware checks and initial production tests, the key part of the overall project – full-scale automation of Infantose production – was completed by the end of March. The production plant was finally put into operation in April. A second project phase that involved automating and expanding capacity to meet whey delivery needs, which had been agreed during the first phase, was completed between October 2016 and January 2017. Complete expansion of process automation for 'Molke 5', including the integration of all the necessary interfaces into the existing plant, was completed successfully and allowed for plant continuity with a minimum of downtime.

Thomas Kirner: "From a technical perspective, the number of familiar processes far outweighed the new developments for the 'Molke 5' project.

The extra challenge for us, however, was to respond as quickly and as accurately as possible to the conceptual changes made 'in progress'. As a result of changes to the project schedule, it was essential for the customer that we never lost sight of the whole picture in terms of project management and that at management level we were able to dispatch capacities in a flexible manner according to demand." Nonetheless, Kirner is the first to admit that "we were pushed to the limits at times" in terms of coordination and the provision of resources. On the other hand: "The level of flexibility that we had to demonstrate during this project resulted from the changes made when implementing the new concept and as such is also part of the service we offer." Dr. Lars Gorzki, Production Manager Milk & Whey Ingredients at Sachsenmilch Leppersdorf GmbH also draws a positive conclusion: "The excellent cooperation was shaped by the outstanding level of professionalism and expert knowledge required to meet the demanding requirements. This was particularly evident during the commissioning stage when a large number of processes had to be monitored at the same time. Together, we were able to establish the foundations for the successful future production of baby food at 'Molke 5'."