

Focusing on process-oriented materials management

Plant iT smoothly combines flexible process control and consistent traceability

At its Ladenburg production location, BK Giulini has recently converted the recipe-controlled process automation of its centralized mixing plant to the new Plant iT version. Consistently process-oriented materials management organized as a centralized module provides the basis for highly flexible mixing process sequences and thus enables the company to rapidly adjust to varied material specifications. In addition, the material flow acquisition ensures comprehensive batch traceability.



Bird's eye view of the production location in Ladenburg/Germany.

1774 is considered the year when chemistry started to develop into a modern science. Roughly 50 years later, in 1823, the Giulini brothers founded a chemicals factory for the production of sulfuric acid. Nowadays, BK Giulini GmbH is a well-known producer of phosphate-based special products, food additives and industrial specialties. "It's often the little details that make life pleasant: Tasty flavors, perfect dental care, a clean and hygienic household, a fresh scent, ...," the company explains in describing its product range which is subdivided into six user-oriented lines of business. These include phosphates and industrial specialties, products for the paper industry, water treatment and special aluminum chemical products, sanitary products, food production, pharmaceutical and cosmetic products and even parts for shoes. In Ladenburg, one of the most important BK Giulini production locations, a mixing plant is the centralized process level for the production of phosphate-based food additives. The obsolete controller of

the mixing plant urgently required modernization, and the company took this opportunity not only to retrofit its DCS controllers, but also to update its entire process control software to meet current and future requirements. The approximately 200 signals to be captured by the automation components only play a minor role in this context: Highly flexible process preparation and control are the key requirements in regard to the recipe-controlled process control system. Production changes have to be prepared in detail in order to prevent the use of incompatible materials. Before launching a new production series, an incompatibility check with regard to the previous production is therefore performed automatically. Based on information stored in a database, the system suggests measures for assuring the quality of the process and the products involved. Consistent batch traceability based on the continuous logging of all material flows is a core prerequisite in order to achieve utmost flexibility of production sequences and the components involved.

High flexibility as a challenge for automation

A large number of different components, the acquisition of all material flows, the requirement of consistent traceability, precise batch dosing and the required checks for the prevention of material inconsistencies all amount to a very complex portfolio of requirements with regard to process automation. Considering these specific particularities, BK Giulini in a first stage placed an order for a conceptual study on innovative process automation. A comprehensive appraisal, taking into account specific requests for process optimization, and the resulting feasibility study, including a solution concept, provided the basis for realization. In light of these automation requirements, the migration from the old to an updated controller generation was no feasible option: The future-oriented solution is based on an entirely new automation concept. At the core of this solution are the Direct iT, Batch iT and Acquis iT modules with Plant iT material, the process-oriented materials management module in the current Plant iT version. All Plant iT system

INFO



Company:	BK Giulini GmbH
Sector:	Food
Location:	Ladenburg
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modules provide a centralized engineering environment with a shared database and a uniform user interface for parameterization. This environment allows the user to call up all system and configuration data via a tree structure similar to the Windows® Explorer. It provides access to user administration tools, message profiles, pools of graphic elements for visualization, etc., and also to the entire plant structure, even including individual actuators and sensors defined using cascaded geographic codes. Even entire sequences within the process can be conveniently specified, and programming is to a large extent replaced by the setting of parameters. This approach also allows the definition of properties relevant for storage locations, materials and transactions within the system. Materials with an identical set of relevant properties are grouped into material classes and precisely described through the parameterization of these properties. Plant iT thus provides ideal prerequisites for the fully automatic recording of all consumption values in the process control system. The Plant Direct iT module provides the interface to the actuators and sensors in the process. BK Giulini's process control system – based on the Simatic S7 DCS – integrates the approximately 200 signals into the automation system.

application profile

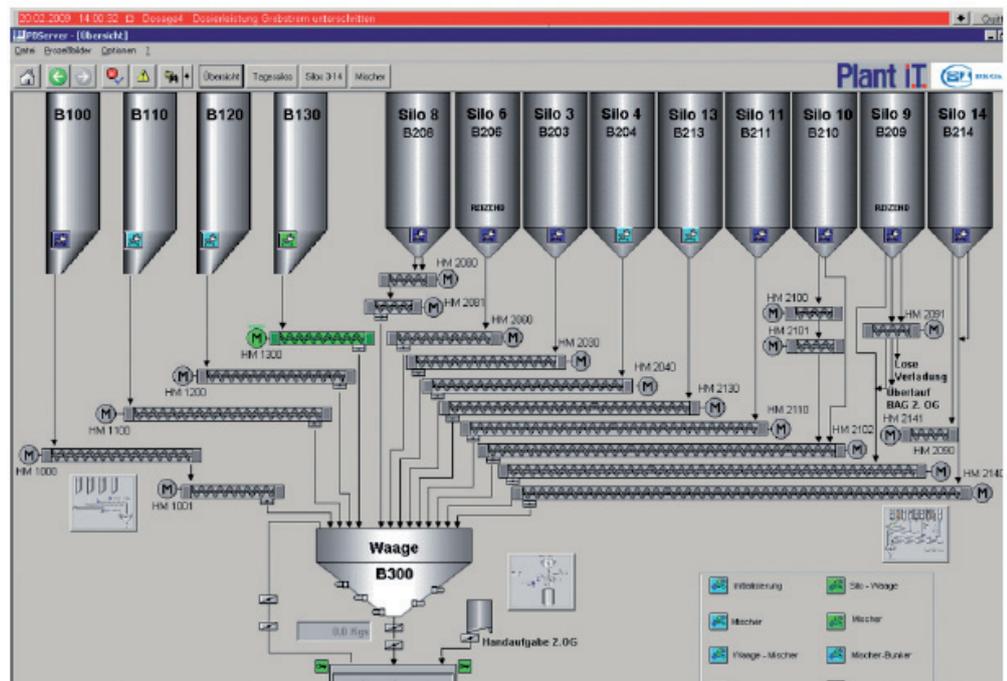
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Batch processes and process-oriented materials management smoothly interlinked

The Plant Batch iT module has been designed as a powerful recipe and order management system which meets the specific requirements of recipe-controlled batch processes. Plant, process and recipe modeling is performed either strictly in accordance with ISA 88 or based on simplified models derived from this standard. Combined with process descriptions, the processing of parts lists which can also be exchanged with external systems simplifies the processing of a large number of different items. With the new Plant iT, process-oriented materials management, which was previously an integral part of the Batch iT module, has been further developed to the independent automation module Plant iT material located on the MES level (Manufacturing Execution System). Based on this production and process-oriented materials management system, production management, materials scheduling and also quality management now take into account technological requirements and are no longer merely focused on commercial aspects. With Plant iT material, the storage structure of all large and small components, in stock at BK Giulini in one large and one small silo group each on different levels in the production building, is now organized with high precision down to the individual package. Each Plant iT module independently communicates with the higher-level materials management module Plant iT material and enters records. This module thus combines the entire functionality of storage management, stock control, batch tracking and also statistical evaluations and provides consistent material feed rates for the mixing process. The Plant iT process control system allows the linkage of the process level to the materials management system in real time. Plant iT material is therefore the perfect tool for

- material and batch tracking,
- sequence and resources monitoring,
- quality assurance and
- process optimization.

Based on master data, all storage locations, storage transactions and materials are captured with the utmost precision, and all material movements and transactions are recorded in the database in nearly real time. This not only includes all data created automatically for large components and finished products by the recipe controller, the process control system, the incoming goods receipt system, the dispatch and storage systems, but also the recording



of all manually fed small components from incoming goods receipt throughout the process up to goods issuing. To make this sequence as simple and safe as possible for production, BK Giulini has equipped its manual feeding stations with WLAN manual scanners (as illustrated in the photo). All consumption values can be precisely assigned to a specific product and batch. And finally, the required flexibility with regard to material selection and the control of the mixing process in no way compromises quality assurance, because precise batch tracing ensures the highest quality levels. The Plant iT process control system resides on a consistent data, information and communication structure which – open and hardware-independent – extends from the process level, including sensors, fixtures, motors and actuators, to the MES level, including production and machine data acquisition, the control center and system control, and even includes the higher-level ERP system (Enterprise Resource Planning).