

Plant Simulation Food and Beverage



Simulation in the Food and Beverages industry

Simulation projects in the Food and Beverage sector require specialized solutions to handle the complex combination of strong seasonal demand fluctuations, high turnover, increasing product and packaging diversity, and rising energy and raw material costs.

High demands are also placed on the manufacturing process to guarantee the quality, purity and freshness of the products. Complex systems and technologies have evolved to ensure that manufacturing and logistics processes meet current and future requirements. Simulation is a proven strategy to fine tune these complex systems, to first understand limitations with the current system, and then test new strategies and investment plans, all without disturbing or interrupting daily operations.

The general aim is to find an optimized solution based on compromises between performance, flexibility, and return on investment.

By identifying bottlenecks and non-value adding processes early in the development process, simulation can increase plant efficiency without increasing the investment risk.

Benefits:

- Bottleneck identification and elimination
- Optimized set-up and wash-down strategies
- Increased throughput by as much as 30%
- Confident decisions from future performance knowledge
- Stable and balanced production
- Minimised product contamination and wastage
- Reduced energy footprint and raw material consumption



Managing Complexity

Typical questions a simulation model deals with include:

- Where are existing bottlenecks in the system?
- Where to focus first for maximum impact (e.g. cleaning, changeovers, batch sizes, production planning and control)?
- What is the best way to minimize inventory?
- What difference will additional plant capital investments make – are there better ways to spend the money?
- What are the current plant limitations regarding expected future products and demands?
- What is the best approach for harmonizing customer demands, incoming goods, batch sizes and packaging lines?

In complex systems with large interdependencies such as in food production plants, it is nearly impossible to manually estimate how the system will perform. That is why simulation is an essential planning solution for a successful future.

iSILOG has developed an additional solution for the food and beverage industry based on Tecnomatix Plant Simulation from Siemens PLM Software. The solution includes industry-specific objects such as tanks, mixers, pipes, grinders, filling stations, packing, palletizing and storage. Use of these standard objects makes it easier to model an existing or planned production process.

The iSILOG solution breaks down the borders between continuous batch processing and discrete production processes common in the industry. It covers special functions such as cleaning, batch- and recipe-management. It makes it possible to model the complete flow, from incoming goods, batch processing in tanks and special equipment, filling, packing and palletizing through to finished goods storage in a warehouse. Plant Simulation provides interfaces to Excel, XML, and other databases to integrate the simulation into an existing software environment.

Plant Simulation will support the complete lifecycle of a food and beverage production plant. From designing the manufacturing plant, virtual commissioning of production control through to advance online production planning and scheduling.



The applicability of the food and beverage library covers many areas in the food production market, for example:

- Brewing, soft drinks and milk processing
- Fresh and frozen food
- Instant soup
- Snacks and candy
- Animal food
- Agricultural raw materials

A model based on the food and beverage solution can vary from a single production line to a complete plant including raw material intake and final product storage.

Transparent Planning

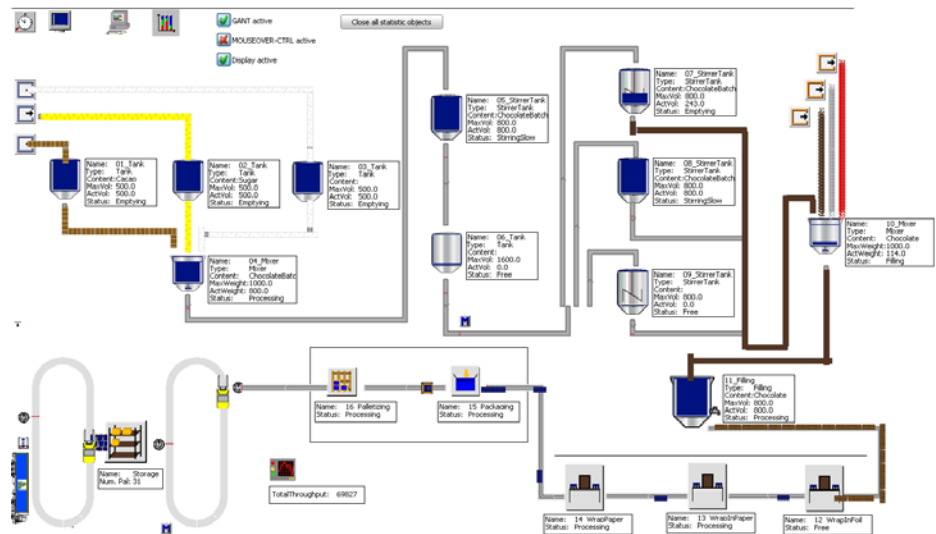
The simulation model encompasses an animated and reproducible production flow. The animation allows you to follow the material flow and to observe tank levels, orders, equipment status. Enhanced statistics show tank levels over time and Gantt charts with detailed order information for all equipment. The simulation serves as communication platform to educate and inform the people involved in managing and operating the existing system and the future system.

Some of the benefits achieved by customers using the F&B library include:

- After completing the simulation analysis, one tank could be removed from the new equipment list, saving 400 000€
- Service reliability and delivery data quality improvement from 85 to 100 percent without any additional investment
- A 70 percent reduction for onsite commissioning
- Reduced energy consumption by more than 5 percent, leading to reduced costs and higher profitability



FOOD AND BEVERAGE - Production of Chocolate



The Food and Beverage library expands Plant Simulation with industry-specific standard objects and reports, to help you overcome the challenges of a complex environment and safely plan for a successful future.

More information

iSILOG is an official Siemens PLM Software Solution Partner. We sell Plant Simulation software and the Food and Beverages library, and provide our customers with maintenance support and training. iSILOG also offers comprehensive project services in the field of simulation and virtual commissioning to meet specific customer needs.