

Unilever's Detergent Powder Plant

Dryer Control and Optimization Project Increases Production, Reduces Product Giveaway

The Challenge

Key Benefits

- > Increased production at no additional cost
- > Reduced moisture variability by 56%
- > Reduced bulk density variability by 40%
- > Significantly reduced unscheduled downtime
- > Reduced transition time between products
- > Reduced energy use per tonne
- > 95% controller uptime and system reliability

Manufacturers must constantly juggle the dynamics of market demand and production efficiencies, creating precise strategies to balance the two. This was the problem faced by Unilever, an international manufacturer of leading brands in foods, home care and personal care. Faced with increased raw materials costs, the company wanted to maximize the performance of its detergent powder manufacturing plant in New Zealand. The plant is home to a spray dryer that produces over 50,000 tonnes per year of six different concentrate and conventional detergent base powder products at a rate of 8 – 12 tonnes per hour.

The Unilever plant had installed a primitive advanced process control (APC) software in the late 1990s, but due to the difficulty in maintaining the application it was providing no real benefit to the plant.

Cleaning Up Production Processes

The detergent powder plant's specific goals were to improve moisture control and reduce variability in final base powder bulk density, while improving access and visibility to performance data. Achieving these goals would enable the site to better achieve product specification limits and increase yield, while also reducing packing wastage and product giveaway.

After researching available options, Unilever turned to Pavilion Technologies to implement the Pavilion8[®] control solution on its spray dryer to increase overall profitability of its detergent powder product. Pavilion Technologies is the leading supplier of dryer control solutions to the most recognized names in the consumer goods industry like Fonterra and Nestlé.

Unilever chose Pavilion8 over other options for its scalability, usability and ease of integration with existing business and plant infrastructure—as well as its ability to deliver the highest return on investment (ROI) and provide the most sustainable long-term value to the site's operations. The software, which leverages a powerful modeling engine at its core, includes modules to control, analyze, monitor, visualize, warehouse and integrate. The Pavilion8 user interface is available from any PC on the network with access to the server. No software needs to be installed on the client PCs. As well as containing all views necessary for operating, configuring and monitoring the control application, Pavilion8 also displays controller key performance indicators (KPIs), allowing simple and effective monitoring of controller metrics and overall solution performance.

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Setting Goals and Analyzing Benefits

Pavilion applied its ValueFirst® customer engagement methodology to the plant's processes, performing an in-depth benefits analysis and outlining a strategy to achieve key goals and objectives.

Pavilion then designed the dryer control application to meet the customer's business objectives and unique plant challenges, including widely varying throughput, six different base product formulations, all with product changes during production runs and short production cycles.

The Pavilion8 dryer control application controls the drying process by compensating for variations in the slurry density, slurry flow, tower pressures and humidity to improve moisture control and overall product quality. This results in increased product yield, reduced energy usage and powders with a more consistent bulk density. The application can be applied to single and multi-stage drying processes as well as flash dryers and processes with fluidized beds.

Results Are Cut and Dried

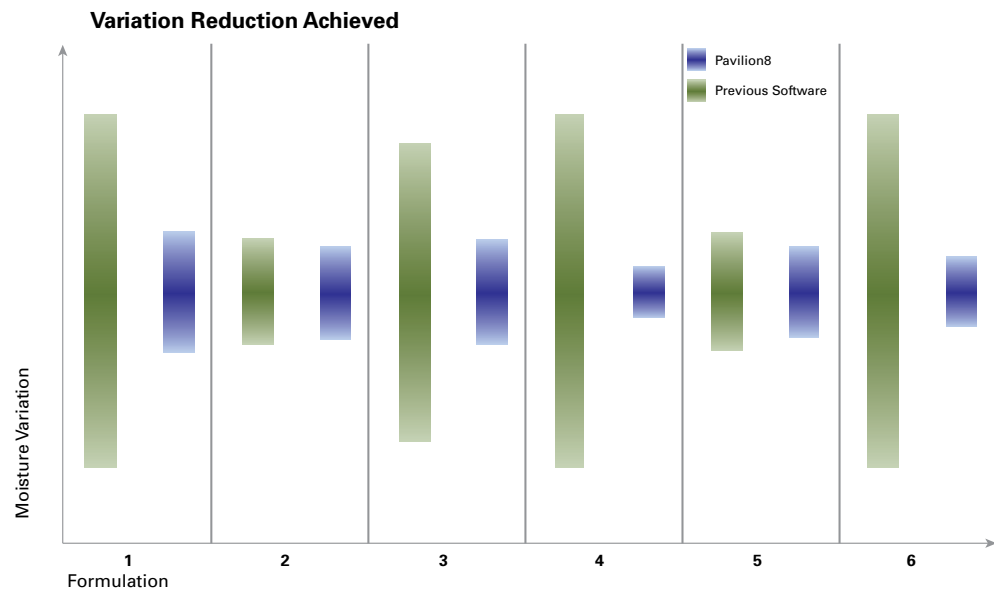
The dryer control project was implemented in less than ten weeks and has an expected payback of less than 18 months. As a result of the project, Unilever has seen immediate improvement in product quality. Plant operators appreciate the solution's ease of use (especially during start-ups), while management derives true value from the real-time performance visibility across product lines and production processes.

Based on early assessments, Unilever expects a significant ROI derived from the following key benefits:

- > Increased production at no additional cost
- > Reduced moisture variability by 56%
- > Reduced bulk density variability by 40%
- > Significantly reduced unscheduled downtime
- > Reduced transition time between products
- > Reduced energy use per tonne
- > 95% controller uptime and system reliability

The Pavilion8 dryer control solution enables Unilever's detergent powder manufacturer to increase production and significantly improve product consistency and operational reliability at no additional cost. That's a project with a clean ending.

Figure 1
Unilever Achieved an Average Reduction of 56% in Moisture Variability. This figure demonstrates the moisture variability on all six products, before and after the deployment of Pavilion8.



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