

Food and Beverage Industry Solution

Dairy Dryer Closed-Loop Prescriptive Analytics Application (MPC)

Analytics Solutions

Our solutions leverage 100+ years of Rockwell Automation innovation, experience and global support.

Industry best practices are incorporated into every application, which is built upon a composite application framework that leverages FactoryTalk® Analytics.

This scalable solution offers interactive options that promote faster user adoption and time-to-value.

Benefits

- Increase throughput up to 8%
- Increase outlet air relative humidity up to 16%
- Reduce energy use up to 12%
- Reduce off-spec product up to 75%
- Increase moisture yield up to 1%
- Reduced moisture variability up to 60%

Realize faster time-to-value benefits, lower life cycle costs and higher lifetime business value



The Challenges

Manufacturers of milk and other food ingredient powders recognize the constant need to operate their processes more efficiently and take advantage of advancements in analytics technology. The goal is to increase throughput while simultaneously reducing costs in order to be competitive globally. Many manufacturers are also shifting more production towards higher value specialty products that require higher quality standards (such as low-fat, no-fat, protein-enhanced, etc.). In order to produce these different products effectively, plant operations must perform within narrower, more consistent product specifications.

In the dairy industry, a variety of dryers are common in the production of powdered products to achieve cost-effective moisture removal from concentrated liquids. Dryers are one of the most energy intensive units used in the dairy processing industries. Optimal operation of this process is essential to reduce costs and help meet final product quality specifications.

Rockwell Automation recognizes these challenges and offers an application focused on delivering valuable dryer control for predictive and prescriptive optimization and performance.

Dairy Dryer Control Application

The Rockwell Automation Dairy Dryer Closed-Loop Prescriptive Analytics Application assists in controlling and optimizing the drying process during the production of powdered dairy products. Powered by FactoryTalk® Analytics™ Model Predictive Control (MPC) patented technology, this application is tailored to the individual configuration of each unit and specific site objectives. It may be a stand-alone option or combined with the Evaporator Control Application for a complete drying solution.

Real-time control and predictive optimization of the process to improve efficiencies and reduce costs

Application Scope

This application works with single and multi-stage spray drying processes as well as flash dryers and processes with fluidized beds. It controls product average moisture to a desired target while reducing overall moisture variability. Relative humidity and capacity are also managed to help achieve optimal performance.

Moisture Management

The MPC software is a predictive analytic solution that compensates for variations in the milk solids concentrate as well as ambient air humidity and other disturbances that affect drying efficiency. By reducing moisture variability, the average moisture target can be increased without compromising product quality. This increase in moisture target can also produce higher yields from the same milk solids, increase dryer capacity and reduce product re-work and energy usage per ton of finished product.

Early Engagement and Capacity Management





This application may include early engagement control, which sees the dryer under prescriptive analytics and predictive optimization. This helps in achieving optimal quality and thermal efficiency within minutes of the dryer commencing powder production.

Capacity management is achieved by improving the thermal efficiency of the dryer and controlling chamber temperatures and airflows to achieve the capacity target. At the same time, the absolute chamber relative humidity constraint and product quality are optimized.

Performance Metrics and Visualization

Real-time visualization in the FactoryTalk InnovationSuite platform presents metrics that allow operators and management to monitor the performance measures of production, quality and energy. These dashboards allow current and predicted plant performances to be viewed and managed to realize and sustain the lifetime business value of an investment in FactoryTalk Analytics applications.



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