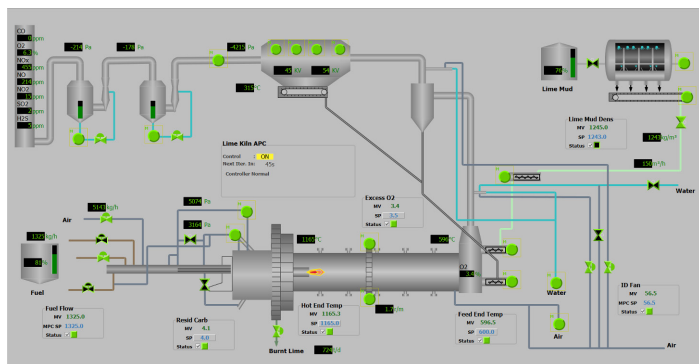


OPT800 Lime

ABB Ability™ Advanced Process Control for stabilized and optimized lime production in a pulp mill



OPT800 Lime overview display

The lime kiln operation in the kraft pulping recovery process, though straightforward in principle, can be challenging to operate at high efficiency. Some of the difficult issues faced by kiln operators include low thermal efficiency, high fuel consumption, process delays, build-up of rings and dust, overheating of refractory, poor quality of lime and increased emissions.

OPT800 Lime manages these challenges to achieve optimum control and efficient lime production. The ABB Ability™ Advanced Process Control (APC) solution works to optimize lime production rates; reduce energy consumption and emissions; increase re-burned lime availability; decrease residual carbonate variations; and improve the overall mill operation with increased visibility over the process. It combines laboratory results by operators with model-based predictive control, thus getting the best of both approaches in a fully product-specific solution, with minimum need for on-site development.

Features

- Production rate control
- Burning zone temperature control
- Draft control
- Residual carbonate control
- Control usage reports
- Real-time adaptive modelling: Automatic adjustments based on process changes
- Higher-order model support: Captures process dynamics accurately

OPT800 Lime results in uniform lime quality with low energy consumption and reduced emissions. The Advanced Process Control solution analyzes residual carbonates during laboratory tests to optimize control targets and ultimately produce lime efficiently and economically.

- Cost optimizer: Looks for ways to optimize operational costs within process constraints
- KPI dashboard and control usage reports by day/shift
- Performance monitoring, with both on-site and remote access for customer and ABB
- Task-oriented, user-friendly and customizable operator displays

Benefits

- Increased production rate
- Reduced energy consumption by up to 10%
- Reduced excess oxygen variation by up to 60%
- Reduced lime quality variation
- Reduced fuel consumption
- Improved re-burned lime quality

How it works – Getting best lime quality and production rates

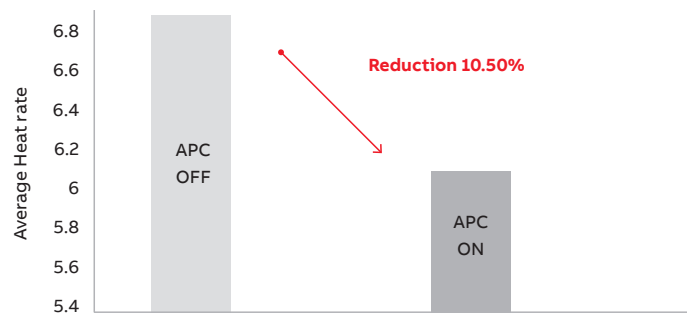
OPT800 Lime introduces frequent but small adjustments within the operational limits to obtain continuous optimization, thereby reducing the process variance and improving the overall mill performance. The adjustments are made by controlling the temperature profile, flue gas emissions, lime mud flow and residual carbonates of the refractory. At its core, the APC solution utilizes a model of the kiln process to accurately predict process variable interactions. These lead to smooth and stable mill operation and uniform lime quality. Control performance will not degrade over time with always-on monitoring and analysis of the APC solution.

- **Lime kiln controls** include temperature profile, excess oxygen, mud feed, mud density and fuel flow control. These are used to manage the temperature profile while maintaining re-burned lime quality at optimal levels. This, in turn, extends lime refractory life due to more stable operations and low temperature fluctuations.
- **Production rate control** accounts for the process dynamics and coordinates the ramping up or down of various operating parameters such as the lime mud flow, lime mud density, fuel flow, etc. to ensure minimal quality variation and off-spec lime during production rate changes.
- **Residual carbonate control** is an optional feature of OPT800 Lime to maintain the optimal levels of residual carbonate. Residual carbonates are measured with the help of laboratory analysis and the system monitors long term trends of laboratory test results to provide optimized control targets.

Real-time adaptive modelling

Dynamic model adjustment and adaptation in real time is a unique feature to ABB's APC platform. It means process models (covering the digester, oxygen, bleaching, washing, causticizing and lime operations) are dynamically updated if the process conditions change, for things like grade changes, production rate changes, etc.

If any important process condition or property changes, the models can be updated automatically, keeping production and quality smooth and consistent.



OPT800 Lime helped an Asian kraft pulp mill reduce the annual average heat rate (GJ/ton) by 10.50%

Operator displays and reports

Highly-intuitive, task-oriented and easy-to-access operator displays are provided to monitor real-time, historical and prediction trends data as well as modify tuning parameters. Using OPT800 Lime, operators can create their own displays using the predefined graphical elements to meet their specific needs.

The reports module calculates the key performance indicators such as controls utilization, heat rate, fuel consumption, and lime quality and presents them in the day/shift report. OPT800 Lime is delivered as a subscription-based service and consists of the state-of-the-art APC installation, start-up, and training, as well as tuning and monitoring services.

