



OUTOTEC® PRETIUM CALCINER OPTIMIZER

Combining real-time plant measurements with our profound process know-how, the Outotec® Pretium Calciner Optimizer ensures operational stability by continuously assessing process variables, automatically detecting and correcting detrimental process fluctuations, and calculating possible operational improvements. The system comprises several digital modules that support process operation in alumina calcination plants.

BENEFITS

- Reduces specific thermal and electrical energy consumption
- Enhances operational stability
- Detects and corrects detrimental process conditions, such as sudden changes in hydrate moisture
- Makes fully automated load changes
- Increases operator's situational awareness

The Outotec Calciner Optimizer is a digital solution tailored to your specific process challenges. It ensures your plant and equipment operate at peak performance without the need for mechanical adjustments or redesign. You benefit from optimized process operation around the clock, leading to increased annual production and improved profitability.

How it works

The Outotec Calciner Optimizer is connected to your plant's distributed control system (DCS) and monitors all relevant process variables in real time. It uses our process know-how together with heat and mass balances to calculate the optimized process operation modes and set points.

Using detailed models of specific equipment, the system ensures that all parts of the process plant are operating optimally, either by creating targeted advice for operators or by automatically adjusting process parameters.

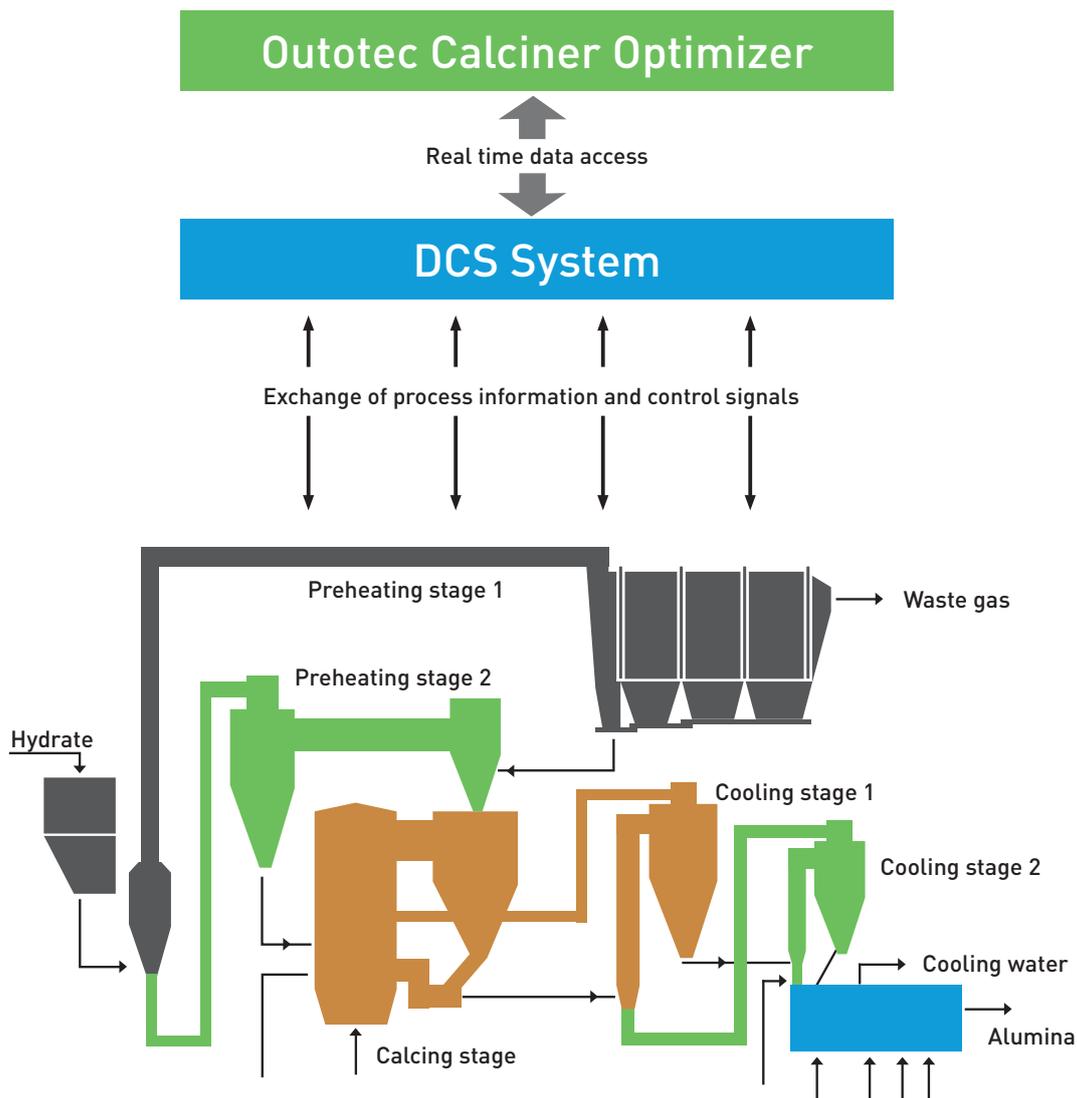
Compared to traditional manual operation via the DCS, the Outotec Calciner Optimizer helps you to operate the plant more efficiently. The tool exchanges information

with your plant's DCS and provides real-time assessment of the process, helping to drastically reduce the workload while increasing operational safety.

Using the operator interface in the control room, operators can quickly and easily adjust high-level process parameters, process limits, and production targets. In contrast to traditional manual operation – where the focus is only on a small subsection of the plant's available measurements – the Outotec Calciner Optimizer system combines many process variables in order to reach conclusions.

Product quality models are adjusted according to your specific plant and operational conditions. Integration of these quality estimation models in the Outotec Calciner Optimizer will assist your operators to match production targets.

This digital solution comprises estimations of critical process parameters, such as hydrate moisture. The valuable information it provides to operators enhances their situational awareness and reduces reaction times at critical operational events.



Unlock the full potential of your plant

Running your plant with the Outotec Calciner Optimizer will unlock the full potential of your existing equipment. You can expect to see several operational improvements, including:

- Increased production
- Reduced thermal and electrical energy consumption
- Better product quality
- Improved situation awareness and fault detection
- Minimized process fluctuation
- Higher plant availability in the long term

While a digital solution allows remote monitoring, benchmarking reveals further plant potential to achieve operational excellence.

Process experience and simulation models

Outotec has decades of experience in calciner plant manufacturing, commissioning, debottlenecking, and operation. By integrating our unrivaled process models and know-how with modern digital systems, we can help both existing and newly built calcination process plants achieve full operational potential.

Operators and shift leaders have access to detailed process know-how and benefit from real-time process

analysis and optimization, fault-detection algorithms, as well as other forms of advice and support.

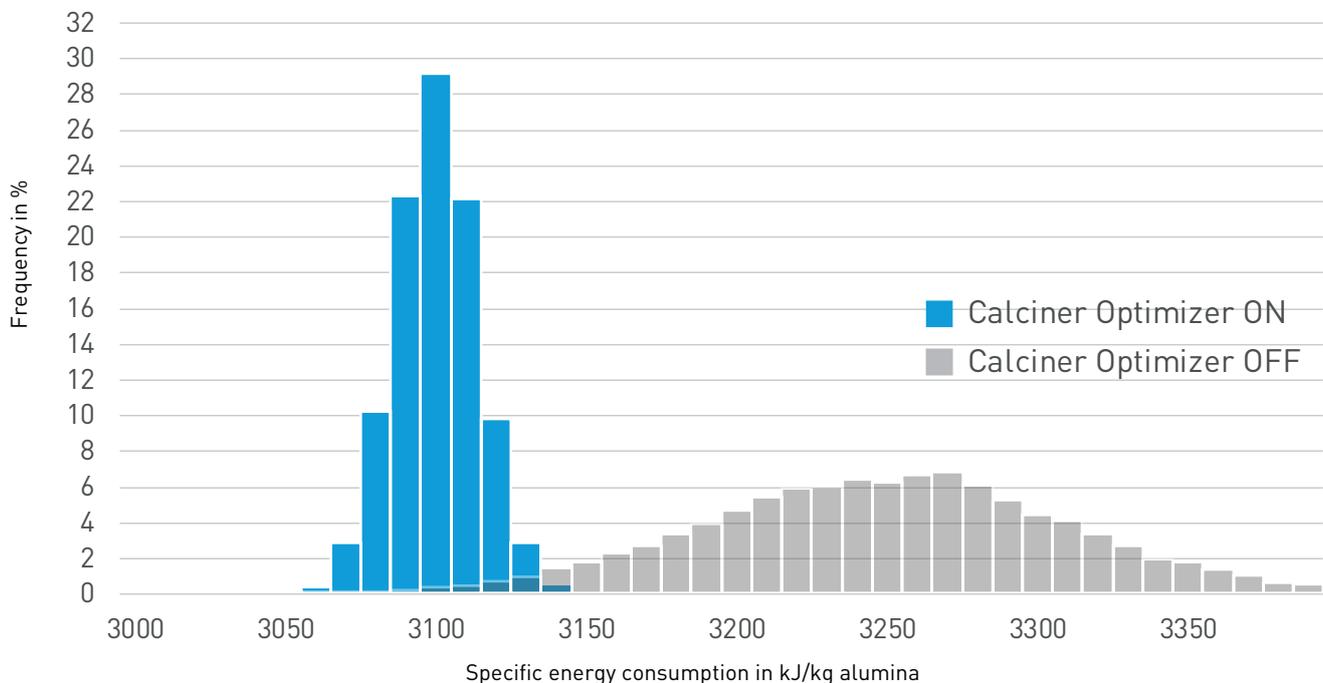
Get reliable eyes on your process 24/7 with our remote services

Make informed decisions that help you improve availability, reliability, and performance with end-to-end operational visibility backed up by expert support. Our state-of-the-art remote services provide you with exactly the right level of support for your needs, and include remote troubleshooting, assessment, and monitoring for equipment and process performance, as well as remote condition monitoring of the technical condition of equipment.

To ensure peace of mind, you always retain ownership of your data. Information is shared within Outotec on a strict need-to-know basis, such as with product line experts and technical services professionals who are working on your particular project. Information security management and practices are based on ISO/IEC 27001 and 27002 standards.

We collect information to help you improve KPIs relating to products, equipment, and processes. Data security covers users, equipment, and the software used to process, store, and transmit information.

COMPARISON OF ENERGY CONSUMPTION, CALCINER OPTIMIZER ON VS. OFF



OUTOTEC CALCINER OPTIMIZER VS. TRADITIONAL MANUAL DCS OPERATION

	MANUAL DCS OPERATION	OUTOTEC CALCINER OPTIMIZER
Way of working	Operator responsible for process operation and recognizing abnormal plant behavior	Automated monitoring based on assessment of complete process and optimization of most relevant process parameters
Process operation	Manual operation and traditional controls for single variables	Optimized operation based on whole-plant assessment
Alarm handling	Safety functions for single variables, range checks, etc.	DCS alarms and safety functions are not affected; high-level monitoring system combines all process information
Feed material and product quality	Daily laboratory analysis	Taken into account during optimization based on metallurgical know-how Estimation of hydrate moisture and use of product quality models
Operator interface	DCS screen displays all plant variables; operator responsible for identifying relevant information	Operators can focus on the most important operational parameters using a dedicated screen in the control room



Outotec provides leading technologies and services for the sustainable use of Earth's natural resources. As the global leader in minerals and metals processing technology, we have developed many breakthrough technologies over the decades for our customers in metals and mining industry. We also provide innovative solutions for industrial water treatment, the utilization of alternative energy sources and the chemical industry. Outotec shares are listed on NASDAQ Helsinki. www.outotec.com