

Industrial Internet in the Lime Industry: How MOSAICO™ Intelligent Platform Changed the Rules in Lime Production

EXECUTIVE SUMMARY

Parallel Flow Regenerative (PFR) technology is the best solution for the calcination process in vertical lime kilns. It assures lower production costs and simplified maintenance and operation. PFR kiln has been substantially unchanged since its invention in the '60s, but the Industrial Internet changed the game.

MOSAICO™ Intelligent Platform, the Industrial Internet platform for the Lime Industry, intelligently transforms operational data into actionable information, accessible anywhere and anytime. It delivers context and drives action based on equipment, location and people.

MOSAICO brings together connected machines, advanced sensors and controllers, and software for optimized performance. It provides robust analysis, visualization and reporting capabilities.

Harnessing the triple potential of:

- Sensors and connectivity
- Smart-machines
- Industrial big-data and analytics

Customers can now:

- Optimize assets
- Optimize operations
- Realize the power of 1%, as intended by QualiCal as small outcomes that can drive big changes in performance and operative margins.

"How much downtime is ideal? We think Zero sounds good."

- Carlo Cella, QualiCal, CEO

THE CHALLENGE

Squeeze every single 1% of operative margin from QualiCal PFR Kiln located in Calcis Group, Germany, by:

- Reducing unplanned downtime
- Optimize maintenance costs
- Smart Maintenance

The customer needed a tool available to the Service Manager for maintenance scheduling, follow up and communication with technicians in his plants distributed throughout Germany.

Furthermore, the same tool has to give technical support to simplify and speed up proper execution of maintenance activities.

THE SOLUTION

The development and implementation of ZERO™ App, embedded in MOSAICO Intelligent Platform, on the QualiCal PFR Kiln, leverages the power of cloud storage and computing, connecting together QualiCal plants spread worldwide.

Through MOSAICO the information coming from the plants is continuously collected, monitored and analyzed in real-time. Maintenance technicians can access this information directly from a mobile device and supervisors can monitor the performance of each plant from anywhere in the world and remotely manage on-site maintenance teams.

Moreover, comparing information coming from different plants helps to identify the best process settings and anticipate breakage and failures, operating the plants at peak performance.



Qualical PFR Kiln in Calcis Group

In the same way, technicians can take advantage of ZERO during their workday: using a mobile device, they can check activities assigned to themselves, access the documentation necessary to complete the operation (maintenance manual, needed tools, video instructions and group-chats, for example) and give feedback at the conclusion, simply through a tablet connected to the cloud.

- ZERO™ Workflow

The customer, and everyone involved in maintenance operations, can move from a traditional hardcopy maintenance plan to a digital and dynamic format. The first advantage is that the entire maintenance team has access to the same and most updated version of the data and plan.

Moreover, maintenance tasks can be created through thunder notification, directly sent from the equipment which detects anomalies through sensors, or investigating the *Unplanned Downtime*

Cost Impact Report where the Service Manager can identify equipment that requires immediate attention.

Based on the type of anomaly, a task will be assigned to delegated personnel (mechanic, electric or operator). At this point, the involved technicians will receive a daily notification regarding pending activities waiting to be taken in charge.

Once the technician accepts the activity, he will be able to access all the information to complete the job successfully: maintenance manual, required tools and Qualitwit™ for technical support.

At job completion, the technician will close the activity, indicating if the problem is solved and inserting notes and comments required by the Service Manager to properly follow the operations.

RESULTS

Through ZERO, maintenance efficiency has increased and, in general, the overall availability of the plant has improved, minimizing unplanned downtime occurrences and time required to restart the plant after a failure.

The most important achievements are an advanced and automatic maintenance task schedule, a tool to easily follow the progress of maintenance operations and an increase in technicians' qualifications, who feel more gratified and empowered, focusing more on the job itself, instead of bothering with marginal operations.

Thanks to ZERO, the Customer can manage more effectively their workday, maximizing their productivity, showing satisfaction for the simplification of maintenance management and the possibility to manage emergencies without having to be physically on site.

ABOUT QUALICAL

In almost 20 years of QualiCal working in the LIME MARKET:

QualiCal identified the PFR, Parallel Flow Regenerative technology, as the best for the CALCINATION in vertical limekilns and for this reason we implemented this technology in the original design of the Synthesis® TWIN SHAFT LIME KILN.

At present more than 20 kilns worldwide are in operation, confirming the validity and affordability of Synthesis solutions. Another 20 new kilns projects are in progress – from the smallest Synthesis 40, with a capacity of 150-200 tpd, to the biggest Synthesis 145 for production up to 800 tpd.

At the same time, QualiCal developed a unique and original design, providing plug & play QualiCUBE MODULAR solutions for quicklime hydration, hydrated lime classification and grinding and lime sizing.

IIoT is changing QualiCal skills and has turned QualiCal into a provider of the entire lime production experience! Combined with our expertise as suppliers of kiln components, steel and

hardware, QualiCal now designs intelligent lime plans, develops advanced analytics, predictive maintenance and social open source information and provides an expert workforce dedicated to the complete lime kiln experience.

ABOUT THE INDUSTRIAL INTERNET CONSORTIUM

QUALICAL has been a member of the Industrial Internet Consortium since **November 2014**. The Industrial Internet Consortium is a global public-private organization of over 240 members, formed to accelerate the development, adoption and wide-spread use of interconnected machines and devices, intelligent analytics, and people at work. Founded by AT&T, Cisco, General Electric, IBM and Intel in March 2014, the Industrial Internet Consortium catalyzes and coordinates the priorities and enabling technologies of the Industrial Internet. Visit www.iiconsortium.org.