

# PiT Predictor CaO – Transforming discontinuous laboratory analyses into process control values

PiT Predictor CaO is a software solution to estimate (predict) the current free CaO content of clinker as a supplement to the laboratory composition analysis. This kind of software is also called soft-sensor. In contrast to a laboratory analysis that is typically carried out every two to four hours, the soft-sensor shows a continuous signal thus increasing the observability of clinker quality trends significantly. The now continuously available signal can be used for control purposes.



## Motivation

The control of a typical kiln system for clinker production in the cement industry is quite complex. The operations team has to balance different technical and economic targets like

- production volume,
  - alternative fuel mix and usage,
  - quality of clinker,
  - emissions,
- to name just a few.

Often the operational decisions are based on uncertain information, particularly with regard to the currently produced clinker quality. The latest laboratory analysis could easily be a few hours old. PiT Predictor CaO eliminates this time gap by calculating a continuous signal based on a sophisticated process model. The result is directly available in the control room to be used in day-to-day operation. This enables the operations team to make better decisions and maintain the product quality permanently.

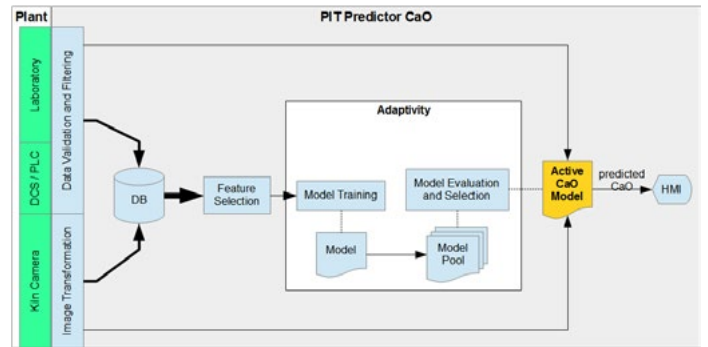


Fig. 1: PiT Predictor system overview

## Application

PiT Predictor CaO runs in numerous cement plants all around the world, either as a stand-alone solution or as an integral part of PiT Navigator Kiln, Iqony's main APC (Advanced Process Control) solution for the cement industry. Already during project execution, clients obtained an objective standardized assessment of their own quality estimation process starting with the sampling of material, the transportation of samples, and finally the analysis in the lab. Often this chain caused unexpectedly high uncertainty of the laboratory results. In many cases, suggestions for improvement were implemented and have helped to improve quality control dramatically. Based on a reliable quality estimation process, PiT Predictor CaO delivers consistent estimations of the CaO in the clinker. Sophisticated internal modules take care that the internal process models are always up-to-date and reflect the reality of clinker production as closely as possible.

## Project Outline

PiT Predictor CaO builds on top of PiT Indicator Kiln or any compatible thermography system of selected suppliers mounted at the kiln head.

- Standardized assessment of the existing quality determination process (laboratory)
- Commissioning of the process interface and start of the data acquisition (for ~1 month)
- Set-up of the software's core components
- Manual training of initial process model(s)
- Activation of the model(s) on-site
- Commissioning of automatic model evaluation and update
- Report of the achieved prediction accuracy

## Preconditions

- PiT Indicator Kiln or thermography system of selected suppliers mounted at the kiln head
- Internet connection to establish remote connection

## Scope of Supply

- Instructions to carry out a standardized assessment of the quality determination process
- OpenVPN software for remote maintenance and commissioning
- Commissioning and operational test of the software
- Software licenses
- Read-only process interface
- Core components (see Fig. 1)
- Visualization of the CaO trend

## Contact

solutions@iqony.energy