

# Vulcan Materials Company

## Florida Rock Cement Finishing Mill

The Cement Grinding Control Application from Rockwell Automation assists the leading cement producer in achieving significant gains with regard to production throughput, quality, energy consumption and operating costs through automated control.

### Florida Rock Cement

Vulcan Materials Company, a member of the S&P 500 Index, is the nation's largest producer of construction aggregates, a major producer of asphalt mix and concrete, and a leading producer of cement in Florida. Its Florida Rock division, located in Jacksonville, is a leading producer in the state of Florida of aggregates, ready-mixed concrete, concrete block, Portland cement and pre-stressed concrete. This division also manufactures calcium products and markets other building materials. Its cement finishing mill is located in Newberry, Florida.

### Key Benefits:

- 7.6% production increase
- 6.5% specific power consumption reduction
- 95%+ controller utilization
- Improved consistency in operations ROI achieved in 1 year

### The Challenge

Vulcan Materials Company constantly works to provide the highest quality product, while reducing material and energy costs and meeting stringent environmental regulations. The company also strives to continually achieve process efficiencies and tighter control through its existing equipment and technology infrastructure. However, when faced with the limitations of a manual approach to optimizing its finishing circuit, the Florida Rock mill moved to automated process control with Rockwell Automation.



### The Rockwell Automation Solution

The Florida Rock facility sought the Rockwell Software Cement Grinding Control and Optimization Solution from Rockwell Automation as a way to truly optimize the finish mill process. Leveraging the Rockwell Software Model Predictive Control (MPC) technology, the application continuously assesses current and predicted operational data, compares them to desired results, and computes new control targets to reduce process variability and improve overall performance. Florida Rock worked with Rockwell Software and its proven ValueFirst® customer engagement methodology. Through this process, the two companies identified numerous variables that can affect the production process and developed the controller to fully utilize the mill's potential under existing system limitations.

ValueFirst helped the customer identify the following objectives:

- Maintain product quality (Blaine and 325 mesh) within specifications
- Reduce process variability and improve operational stability
- Maximize fresh clinker feed rate subject to equipment constraints
- Reduce power consumption per ton of cement

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**PlantPax**  
Process Automation System

**Rockwell**  
Automation

*"With fully-automated, realtime monitoring and process control, we have been able to transform our operation. We now produce better quality cement at a lower cost and have been able to achieve a return on our capital on the combined Rockwell Software control application and the Insittec analyzer in one year."*

**John Murphy**  
Production Manager  
Florida Rock division of  
Vulcan Materials Company

## Florida Rock Results

Results for the finishing mill included a 7.6% increase in production, power consumption was reduced by 6.5% and controller utilization exceeded 95%. Consistency in operations was improved and ROI was achieved on the Rockwell Software control application in 1 year.

## Mill Addresses the Challenge of Blaine

While Florida Rock's advanced control application has helped it run more consistently and efficiently – for longer time periods and with less manual input – personnel still recognized limitations with regards to Blaine, or average particle fineness measurement and its correlation to cement strength.

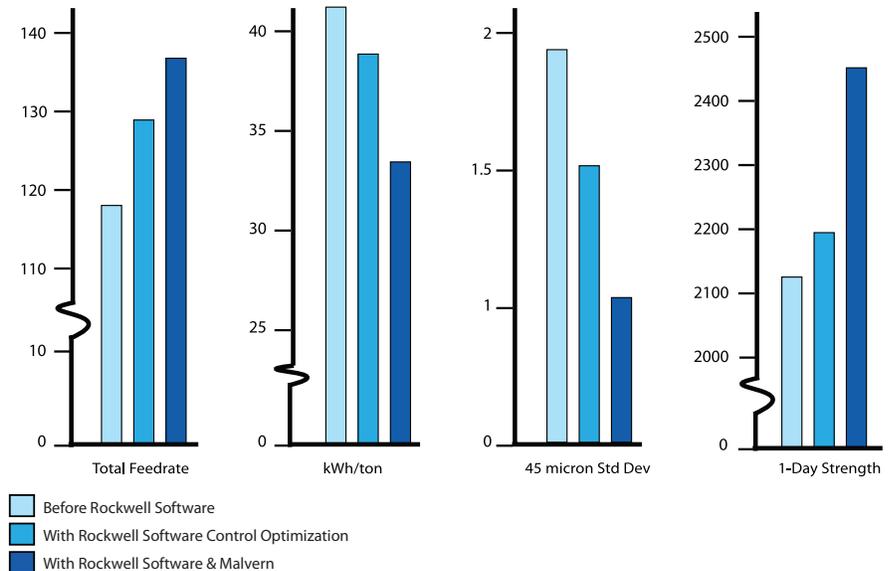
Results from an in-house laboratory study showed 1-day strength correlated more closely with key particle size parameters than it did with Blaine. The next logical step was to move to on-line particle size measurement.

Malvern Instruments installed their on-line Insittec Fineness Analyzer, a laser diffraction system that generates real-time particle size data. Measurements are rapid, generating up to four complete particle size distributions every second. All aspects of measurement are fully-automated. The analyzer software facilitates integration with the Rockwell Software system and the plant's control platform. Refining the control model to use these parameters was the final step in achieving fully automated monitoring and control.

## Insittec Sensor with Rockwell Software Control Application Achieve Additional Benefits

Vulcan Material's Florida Rock facility has achieved additional benefits from the Malvern Insittec analyzer working with the Rockwell Software control application. Together, a 15.3% production increase has been gained as well as a 20.3% reduction in power consumption, based on full particle size distribution information. These process improvements built upon the increase already achieved with the Rockwell Automation application alone.

Comparison Chart of Key Benefits



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