

# CMM Industry Solution

## Crushing or Grinding – Cement Finish Mill Application

Realize faster time-to-value benefits, lower life-cycle costs and a higher lifetime return on investment

### Benefits:

- Reduce energy cost per ton up to 10%
- Increase throughput up to 10%
- Reduce sizing variability up to 50%
- Improve product quality
- Increase sustainability criteria

### Process Solutions

Our solutions leverage 100+ years of Rockwell Automation innovation, experience and global support. Industry best practices are incorporated into every application, which is built upon a composite application framework that leverages a Service Oriented Architecture (SOA). This scalable solution, when combined with library-based content, offers personalization options that promote faster user adoption and time-to-value.



### The Challenges

Companies face increasingly competitive demands for quality products, while reducing input costs and reconciling operational demands with environmental impact and sustainability objectives. The need for increased flexibility to market demands introduces even greater levels of operational complexity.

From an economic perspective, crushing or grinding to correct sizing specifications at the lowest energy cost is required to produce competitive products. Since mined materials are variable in nature, a solution is needed that deals effectively with these incoming disturbances.

Rockwell Automation recognizes these challenges and offers an application focused on delivering valuable crushing or grinding cement finish mill optimization and performance information.



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**Rockwell**  
**Automation**



Provides real-time control and optimization of the process to improve efficiencies and reduce costs

## Crushing or Grinding – Cement Finish Mill Application

This Rockwell Automation Model Predictive Control (MPC) Application provides control and optimization of the crushing or grinding cement finish mill processes through patented, industry-leading technology.

### Monitor and Control

Monitoring and controlling production can significantly reduce process variability, increase overall production rate and reduce energy cost per ton of product. Furthermore, real-time visibility of production and energy metrics compared to a baseline promotes a performance-driven culture.

Using library-based content, this application can be easily configured to meet individual and specific operational objectives. This application predicts and controls multiple process parameters in real-time. It acts at a very high frequency for efficient and accurate calculation of controller setpoints and predicts process and quality parameters internally. Control actions are updated continually based on actual process values, while plant constraints are taken into account to meet throughput, energy and product specification objectives.

Additionally, incoming feed rate is increased and internal recirculation is kept in balance. Circuit classification is controlled, taking throughput and product fineness

into account. Circuit stability is achieved by obeying process constraints to prevent overloading and unscheduled downtime.

Product fineness prediction (Predictive Quality – SoftSensor) is included to improve feedback to the control application and boost overall production performance.

Operation of open circuit, closed circuit, roller press-ball mill combinations, as well as vertical roller mills, is improved through application use.

### Energy Usage

Real-time performance management is part of this solution that promotes consistent energy awareness, process evaluation and pro-active decision making. Reducing energy usage lowers the direct energy cost component and delivers the added benefit of reduced greenhouse gas emissions from upstream power generation.

### Optimization

This application provides control performance by minimizing disturbance effects from material variations and feed interruptions. Real-time optimization is achieved by increasing throughput to plant constraints and reducing unit cost per ton.

[www.rockwellautomation.com](http://www.rockwellautomation.com)

### Power, Control and Information Solutions Headquarters

Americas: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

Europe/Middle East/Africa: Rockwell Automation, Vorstlaan/Boulevard du Souverain 36, 1170 Brussels, Belgium, Tel: (32) 2 663 0600, Fax: (32) 2 663 0640

Asia Pacific: Rockwell Automation, Level 14, Core F, Cyberport 3, 100 Cyberport Road, Hong Kong, Tel: (852) 2887 4788, Fax: (852) 2508 1846