Rotary Kiln Refractory Monitoring

Rotary kilns are commonly used in the manufacturing of cement, the refining of minerals and in lime reclamation. Monitoring refractory wear is critical to the process.
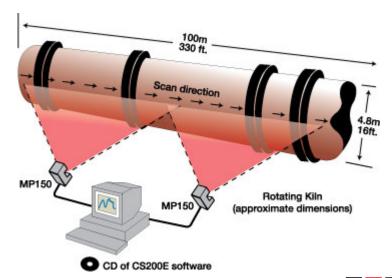
Q
Question

How can I accurately monitor the degradation of the refractory to extend its life and avoid costly shutdowns?

A
Answer

Situation Analysis

Rotary kilns are large steel shells, several meters in diameter and up to 100 meters long, lined with ceramic refractory bricks. Over time, the exposure to heat and abrasive materials wears the brick potentially exposing the shell to temperatures higher than it can withstand. Understanding the wear patterns allows the engineer to adjust the kiln heating profile to extend refractory life. It also provides the opportunity to shut down the kiln to prevent catastrophic failure. Since it is impossible to measure inside the kiln, looking at the outer surface is the only way to determine the refractory condition.

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Solution and Improvements

The Raytek CS200E kiln monitoring system consists of an infrared linescanner, mounted looking at the kiln shell and measuring the temperature at 1024 points along the kiln length (2048 points when two scanners are used). As the kiln rotates, a complete map of the kiln surface temperature is created. Individual IR point sensors are used in concert with the linescanners to "fill-in" any blind-spots and report temperature data for every single refractory brick. Through continuous monitoring software, the operator is notified if a temperature excursion is noted and the system can even automatically activate a fan to cool down the affected area. A powerful database allows the user to scroll backwards and forwards through time to get a perspective on how the brick is wearing and to schedule maintenance at a time that is most convenient and cost effective. This field-hardened system has been installed at over 100 locations worldwide and is designed to operate (maintenance-free) in even the harshest environments.

Raytek Product

Raytek CS200E
  CS201 (single scanner)
  CS202 (dual scanner)

Accessories

- Live Ring Migration module

Benefits

- Extended refractory life
- Catastrophic failure avoided

For customized solutions to your process, please contact:
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