In-Line Particle Size Analyzer Offers Real-Time Monitoring of Industrial Mineral Processes

A.J. DeCenso
Preferred Process Solutions

Stuart Barton
Xoptix Ltd.
Companies Represented

- SWECO
  - Screening Equipment
  - Centrifuges
  - Vibratory Mills

- Ecutec
  - Air Classifiers
  - Grinding Mills
  - Coating Systems
  - Plant Design

- Tomra Sorting Solutions
  - Sensor Based Ore Sorters

- XoptiX
  - On-Line Particle Size Analyzers
Xoptix On-Line Particle Size Analyzer

Why is it needed??
Let's Examine the Typical Sampling Process

- Is the sample representative?
- How often is the sample taken?
- Are the sample bags properly labelled?
Let’s Examine the Typical Analysis Process

- Is sample properly prepared for analysis?
- Is the instrument’s cell clean?
- How many samples are in the queue?
- Is the lab tech properly trained?
How Long Does it Take to Get Results?

With typical manual sampling and analysis…

• at best 30 minutes…
• but usually hours
How Long Does it Take to Get Results?

With Xoptix… 5 seconds!
Xoptix On-Line Particle Size Analyzer
Xoptix On-Line Particle Size Analyzer Video

How it Works Video…
Automatic Cell Clean
Two Case Histories

Case #1: Ground silica from jet mill

Case #2: Ground silica from ball mill / air classifier circuit
Case #1: Ground Silica, \( d_{90} = 13\mu m \)

- Ground silica produced in a jet mill.

- Xoptix sizer data generally matched results of hand sample / lab analyses.
- But the customer was troubled by cyclical nature of Xoptix trend graphs and suspected there might be a problem with the sizer.
Mystery of the Oscillating $d_{90}$

- After some investigation, the customer’s process engineer suspected that the PID on the mill feeder might be causing a varying load in the mill.
- Data from the jet mill’s load cells was used to plot weight of material in the mill.
- The pattern looked familiar…

![Graph showing weight of material over time.](image)
Mystery Solved!!
Case #2: Hoben International Ltd

Located in Derbyshire, UK
Products include:

- ground silica
- cristobalite
- grouts
- perlite
- ceramic Proppant

Materials are milled in continuous ball mills with air classifiers.

Ground silica products range from as coarse as $d_{50} = 40\mu m$ to as fine as $d_{50} = 7.5\mu m$.
• As a result of increasing demands from their customers for greater product consistency, Hoben decided to automate their milling circuits and install an in-line particle size analyzer.

• They initially purchased a competitor’s sizer, but found that it was unreliable.

• Eventually they replaced it with an Xoptix system.
Xoptix Sizer Has Demonstrated Superior Reliability

- The Xoptix sizer has proven to be much more reliable than the unit it replaced.

- In 5 years there has been only one major service, that being a replacement of the ceramic wear parts.
Hoben’s Experience with Xoptix Sizer

Hoben’s goal of product consistency has been met.

Bulk truck drivers are given a sample bag to deliver to their customer with each load.

One customer contacted Hoben and asked if the samples were truly from that truck, or did they all really come from a sample bucket kept for the purpose of delivering identical samples!
A little free advertising for Xoptix...

In-line Particle Analyser

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