

XoptiX



Xoptix Pioneering
Cement Particle Sizing



Why choose Xoptix for cement particle sizing?

- Years of experience in particle sizing technology
- Optimise process efficiency
- Real-time process monitoring
- Size particles from 0.1 to 3000 microns
- Save money from day one

“In-process monitoring puts me in control of my cement process”

Xoptix Pioneering Cement Particle Sizing

Xoptix is an innovative company with a product portfolio built on many years of research and practical experience with cement particle measuring systems. We understand and provide solutions for cement production facilities across the world, with our success built on a reputation of trusted technology that lasts.

In-process particle sizing in the cement industry is growing in popularity as process efficiency is under scrutiny with ever increasing pressure to reduce energy costs and increase cement production.

Xoptix products and solutions are cost effective, designed to be built around your process, provide a bespoke solution which is easy to use and deliver powerful information at your fingertips.

The Xoptix CementSizer can measure all grades of cement in real-time with no measurement delay. Specialist sampling probes and ceramic lined components have been specifically developed for the cement industry to optimize sampling directly from the process and ensure longevity.

Why Is Cement Fineness Important?

Cement fineness is a critical measurement in the production of cement as it directly affects the setting and hardening process. Both strength and flow properties of concrete are reliant on this fineness during cement production. Recognizing the importance of cement fineness, Xoptix have developed an innovative in-process particle sizer specifically designed for the cement industry, to replace traditional laboratory measurement.

It is well documented that more than 1% of the world's energy is used grinding cement to the required size suitable for its final application. Increasing efficiency by proactive fineness monitoring can therefore dramatically reduce energy costs.



Laboratory Analysis vs Inline Monitoring

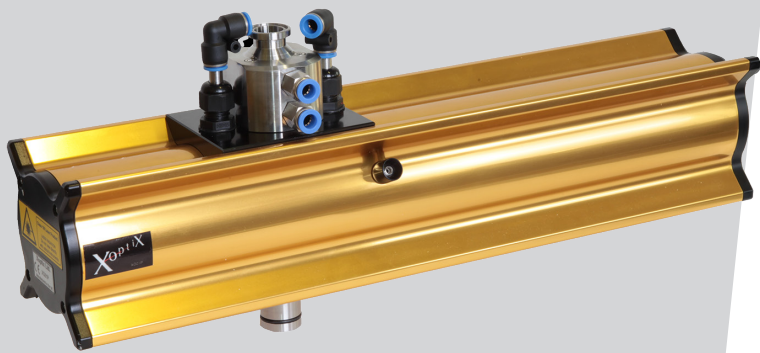
The Blaine laboratory based measurement, which traditionally was used to predict the compressive strength of the product can only give limited information on the milling process. Addition of sieves and laboratory instrumentation improved this, but still left a significant delay in the acquisition of data.

The move from making infrequent measurements (after the event) in the laboratory, to measuring the cement in real time on-line at the process provides many benefits. Not only does this ensure high quality product is produced consistently but it also results in energy cost savings and can increase throughput for those plants that are already working at their nominal capacity. Automation of the process results in increased productivity by minimising over-grinding and reducing the proportion of off-specification product during product changeovers.

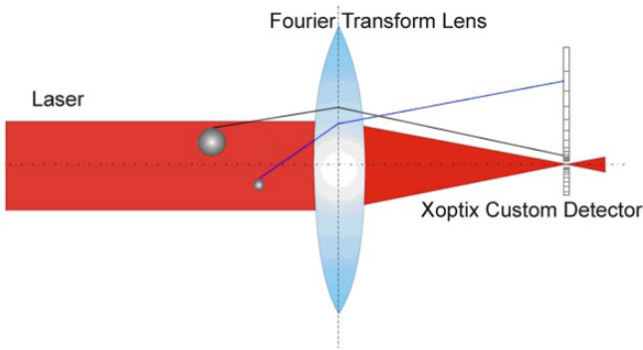
The benefits of in-process particle sizing

- Consistency in cement production
- Increase throughput
- Reduce over milling
- Reduce energy costs
- Rapid return on investment

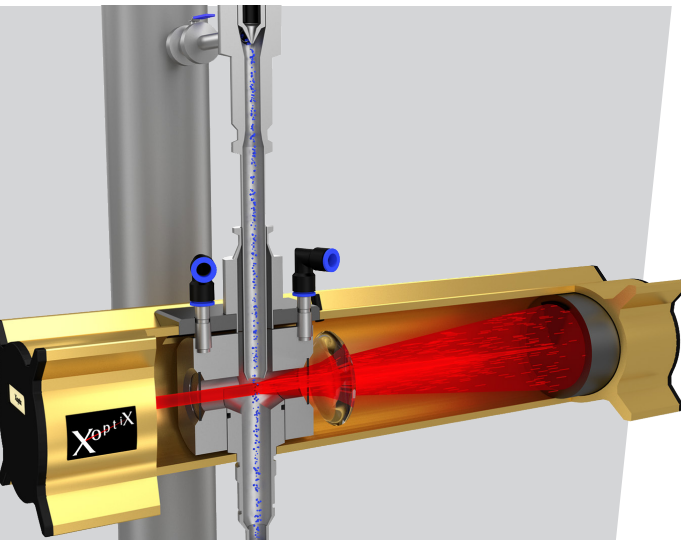
“More than 1% of the world's energy is used grinding cement”



CementSizer Particle Size Analyzer



CementSizer uses laser diffraction technology



Inside the CementSizer

CementSizer In-Process Particle Analyser

The CementSizer with patented technology, acts as the eye of the milling process. Harnessing Low Angle Laser Light Scattering (LALLS), also known as laser diffraction, cement particles are measured in a continual flow with in-process particles sampled directly from the process.

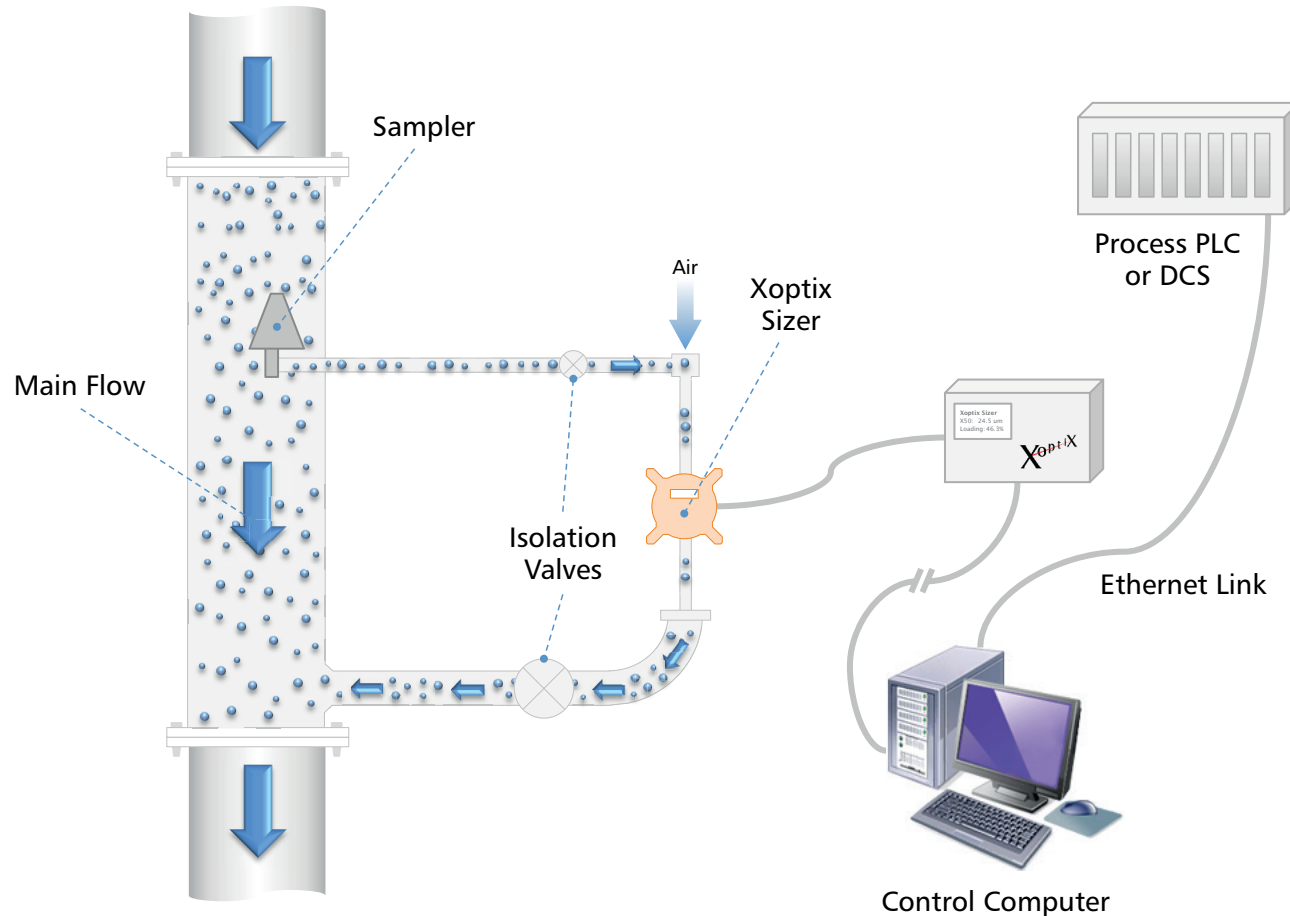
At the core of the CementSizer in-process particle analyzer, is a highly durable laser diffraction instrument, built to withstand the challenges of any cement mill. We use high stability lasers, the best optics, and the highest specification custom designed detectors found in any in-process particle analyzer today, and put it all inside a high quality precision optical bench. This simple step alone, has given us stability not possible with any other system in the industry. Add to that, carefully designed kinematic optical mounts, the latest electronics and an IP65 rated enclosure, making the CementSizer a first within the industry.

CementSizer gives you Process Control

When cement is milled to the appropriate fineness for the grade, a degree of insurance over-grinding takes place in order to be sure it is in specification. The reason for this is that typically samples are measured for fineness in the lab every 2 hours.

In that time the cement may be underground and need to be re-worked due to being too coarse. The main advantage of an on line fineness sensor is the ability to measure key parameters 2000 times per second producing real time data of the state of the process. By feeding this fineness data to the PLC and DCS and automating the control of separator such that in-spec product is produced all the time, the energy expended in insurance over grinding is thus eliminated. An added advantage is that the residence time of the cement in the mill is reduced such that throughput can be increased by up to 5%. For a plant operating at full capacity an extra 5% can result in a payback time of a few weeks, and in a plant not operating at full capacity, the reduced energy costs can result in a payback time of less than 1 year. Other advantages include, laboratory workload being decreased, a lower response time when changing grades, avoiding silo contamination and significantly lower standard deviation in cement fineness. This leads to a more stable product in terms of the short and long term compressive strength.

New CementSizer Sampling System



Patented Sampling Technology

The major technical challenge with any in-process fineness analysis is taking a representative sample of 10kg from a process producing often in excess of 200t/hr. CementSizer can use a direct sampling probe inserted into the process in cement plants with output of up to 100t/hr. For plants with capacities more than 100t/hr it can be necessary to take a primary sample. This uses an auger to extract a sub sample, from which the final sample, is taken into the instrument. Alternatively a newly patented sampler, which has no moving parts, can 'dilute' powders in a conveyed cement process to the levels required to provide the correct amount of material needed by the in-process instrument.

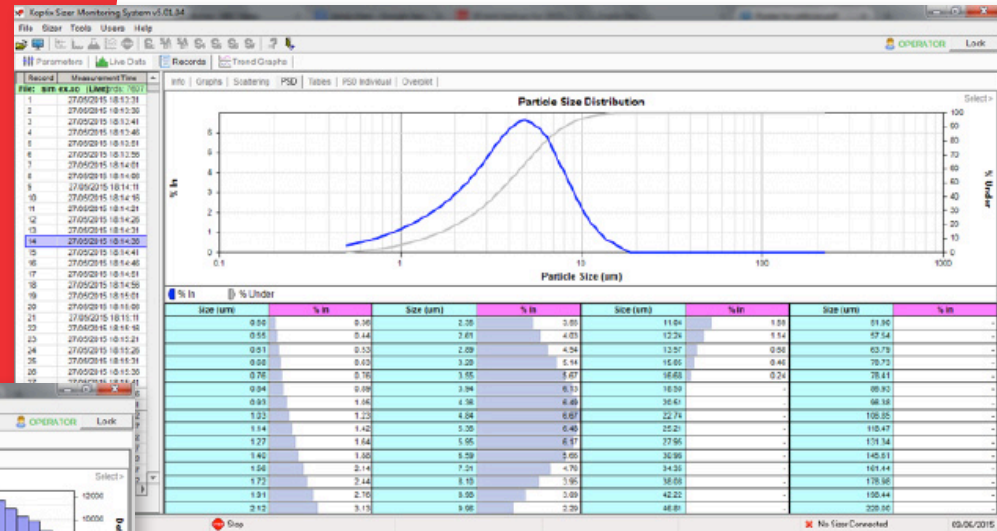
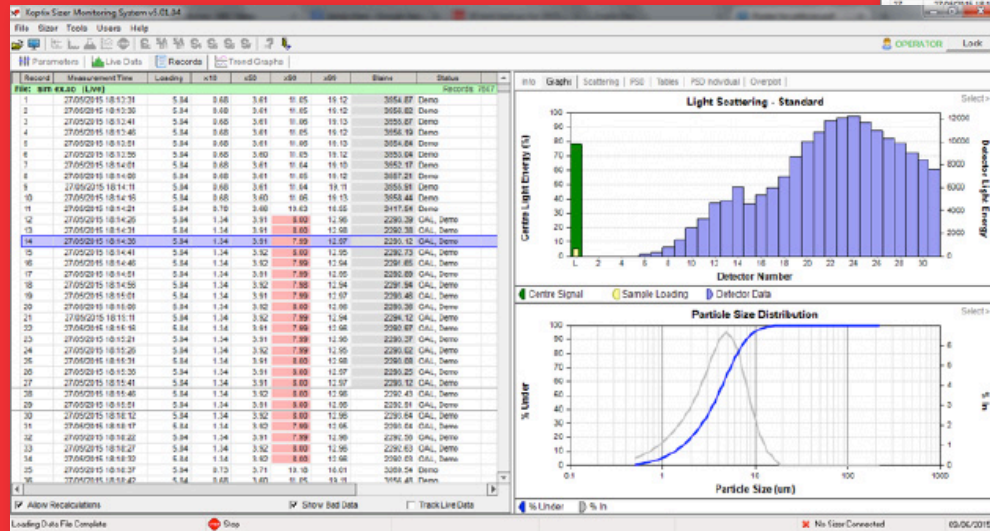
Patented Cement Sampler



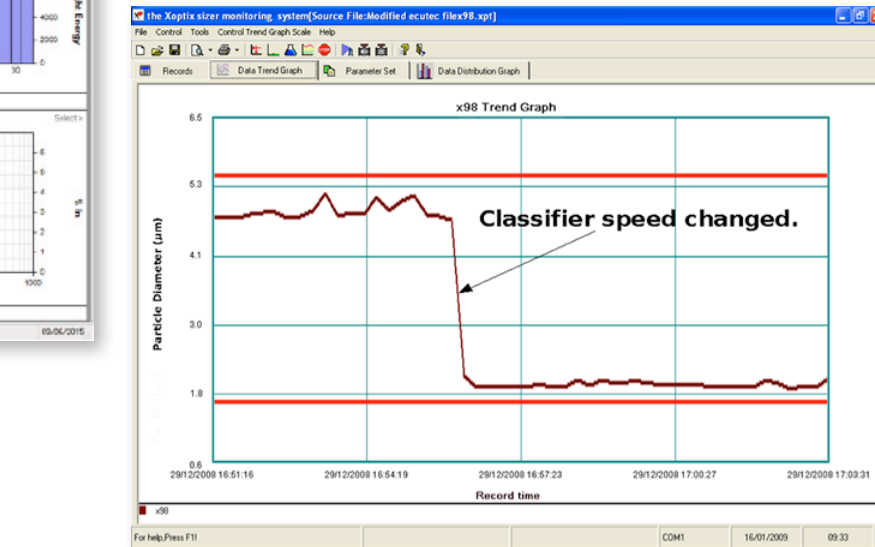
"For a plant operating at full capacity, an extra 5% can result in a payback time of a few weeks"

Detailed Data At Your Fingertips

Very often, 'ruggedised transducers' have limited data output yet at the heart of the Xoptix CementSizer is a laser diffraction instrument that can give the very best detailed reporting and data output. Data output exceeds that of traditional laboratory instrumentation with our intuitive Xoptix application suite.



- At a glance easy to interpret information
- Time trend data shows product consistency
- Detailed data on any time point
- Compatibility with lab data



Every aspect of particle size distribution data is available from instantaneous per second information, to averaging over a complete process cycle, recorded in either minutes, hours or months. Any or all of this data can be output to the control PLC/DCS for fully automated closed loop control.

Maximising Cement Production

The unique automatic cell clean technology, which is standard within every XO in-process particle analysis system minimises downtime from cleaning and maintenance. A pulse of air cleans the sample windows within seconds, so that sampling is continuous and unaffected by sudden changes in the process. Cell cleaning using this technology has not been seen anywhere else on the market and is unique in the widely acclaimed XO particle sizer range.

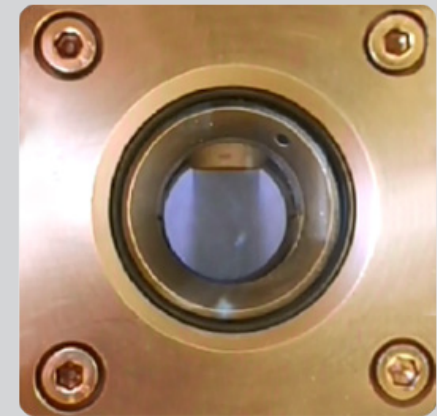
Also to maximise production uptime, the CementSizer has ceramic components to increase durability and minimise long term maintenance. The lifetime of components exposed to cement particles is measured in years.

Output is available to the users requirements, from 4-20ma current loop outputs to ethernet communication with the control DCS or PLC using industry standard OPC protocol.

Xoptix – A Trusted Partnership

In 2005 the Xoptix Team, with their years of knowledge and experience in laser diffraction technology, developed the XO in-process particle sizer which has evolved into the best system in the world today. The XO particle sizer is capable of measuring particles from 0.1 to 3000 microns, is robust and monitors in real-time. The benefits to a process mill of installing an XO particle sizer are that off-line analysis and post-event analysis which is out of date can be eliminated, and human error reduced. For the cement industry the CementSizer increases uptime, optimises cement production in real time and dramatically reduces energy costs.

“Xoptix have installations all over the world, testament to their innovative technology and quality service”



Automatic Cell Clean
minimises maintenance



Ceramic lined components for durability

