

MALVERN PANALYTICAL CEMENT SOLUTIONS

ACHIEVE THE EFFICIENT PRODUCTION OF HIGH-QUALITY CEMENT THROUGH ELEMENTAL, MINERALOGICAL AND PARTICLE SIZE ANALYSIS

Every step in the cement production process is important for achieving maximum efficiency and quality. From stockpile management, production of raw meal, preparation of kiln feed, production of clinker - to the final grinding and mixing of the end product - process and quality control are driven by elemental, mineralogical composition and particle size analysis.

Malvern Panalytical instrumentation can help you to increase the quality and consistency of your cement product while also increasing your return on investment by reducing the cost of manufacture:

- Make the best use of natural resources through stockpile management.
- Extend the life of aging quarries.
- Save on cost of additives by careful analysis of kiln feed.
- Control fuel usage at kiln by monitoring clinker composition and optimize particle size distribution from the milling process.
- Monitor addition of SCMs.
- Save energy and equipment costs by minimizing overgrinding at the finish mill.
- Produce high quality cement with correct mineralogical and chemical composition and fineness.

www.malvernpanalytical.com/cement



**Malvern
Panalytical**
a spectris company

ANALYTICAL SOLUTIONS FOR OPERATIONAL EXCELLENCE

Malvern Panalytical offers process solutions that meet industry demands. Our comprehensive solution packages are now standard in most processing industries, including more than 400 cement plants across the globe. Our analyzer solutions are ideal for cement plants, dry or wet, from manual or fully automated laboratory sampling to on-, at-, and in-line sampling processes.

ASD TerraSpec® Halo Mineral Identifier

Portable, fast non-destructive mineral identification



VIS-NIR full range (350-2500 nm) handheld all-in-one spectrometer that allows you to immediately identify minerals with a simple pull of a trigger for faster delineation of alteration, speedier core logging and quick confirmation of ore mineralogy.

Mastersizer 3000E

Entry level particle size analyzer

Mastersizer 3000E provides a cost-effective, entry level particle sizing system in a compact footprint. It provides a reliable, reference solution for your central/QA/QC lab, for all cement production samples, from clinker and raw mix, through to finished product.

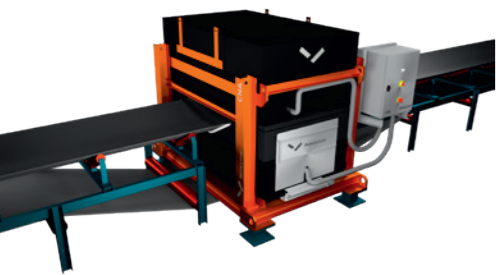


"Great results with the equipment. The Mastersizer 3000 is easy to use. It helps us improve the quality of our products. We are carrying out analysis of cement and raw meal." – Cementos Progreso, S.A.

CNA Pentos-Cement

Real-time raw material process control

The CNA Pentos provides high-frequency analysis of the raw material components, either at the quarry or during raw mix proportioning. The net result is stable and on-target kiln feed which promotes efficiency and stability throughout the rest of the process. The high-frequency control is accomplished without costly sampling equipment and laboratory staffing.



"Without the CNA, the turnaround time of the chemical results was often undependable, having to take numerous samples off of the crushed limestone belt conveyor and always trailing the process. With the CNA, we have been able to reduce waste material and reduce the LSF variability in the raw meal, which in turn leads to lower energy costs." – Suwannee American Cement plant (USA)

The automated laboratory

The power of combining technologies

With automation, the Zetium XRF spectrometer and Aeris XRD diffractometer and/or sample preparation equipment can be combined via a belt connection to create an automated laboratory, capable of both mineralogical and elemental analysis.

Within an automated laboratory, the complete sample transportation, preparation, and analysis process can be automated for fast and automated sample processing.



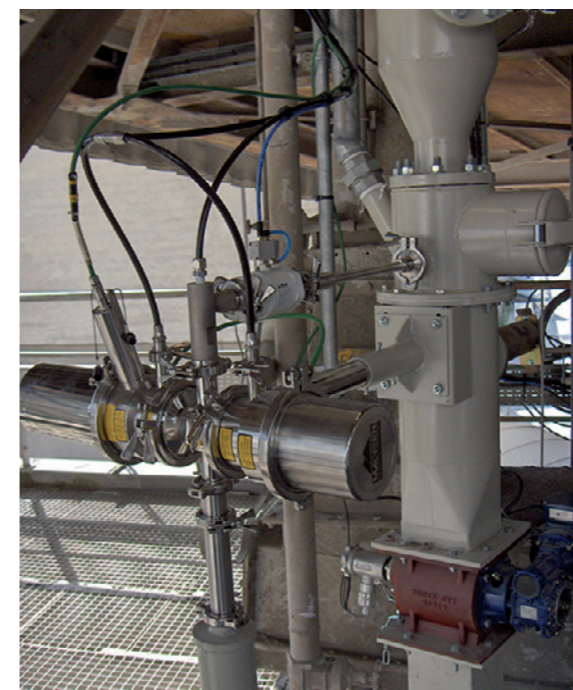
Insitec

A rugged reliable particle fineness analyzer system for use in milling

The Insitec brings full IIOT/Industry 4.0 technology to the cement process. As a fully integrated on-line particle fineness analyzer, it is capable of measuring and reporting a full-size distribution 4/sec and 24/7/365, while in real-time communication with the plant DCS/Control system to enable process optimization.

"The most dramatic change in terms of process economics is the 20.3% reduction in the energy used to mill each ton of cement. Mill power is now significantly lower even though feed rate is more than 15% higher. Milling benefits are also occurring from a 15% reduction in ball charge. As strength targets are now more easily reached, CS3 level has also been reduced, reducing the operating costs of the kiln. The company calculates that the capital investment associated with both systems [an Insitec + process control software] was fully recouped, in energy savings alone, in just over one year." – Vulcan Materials

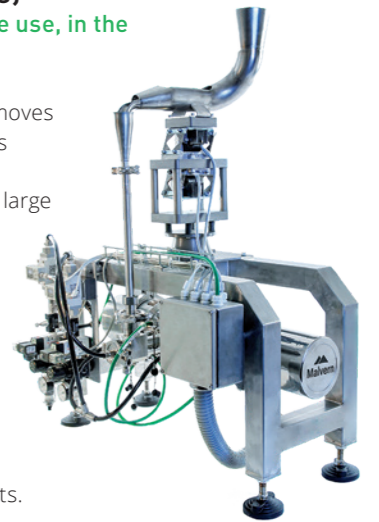
Dynamic classifiers accept the control data from the Insitec and the Malvern Link Automation software, creating what could be considered as a smart milling system. Value is driven by reducing the typical process of over-grinding, minimizing energy consumption and improving control of the milling process. Begin to 'make what you want to make' with on-line fineness monitoring and control.



Insitec Cement Labsizer (automated or at-line)

A rugged system for at-line use, in the process environment

The Insitec Cement Labsizer moves particle sizing into the process environment. A robust, fully automated system, it delivers large sample volume cement measurement and is optimally suitable for manual or automated plant laboratories, or at-line measurement. Designed for minimal maintenance, it delivers consistent, highly reliable operation, even in challenging plant environments.



Claisse Eagon® 2

Safe, simple, high performance fusion sample preparation

Used to prepare glass disks for XRF analysis, this instrument is fully automatic and can process two samples simultaneously. Guaranteed reproducibility with minimum infrastructure required. Fusing cement samples eliminates mineralogical effects and delivers highly accurate and repeatable elemental analyses, in accordance with ASTM norm C114-18.



Zetium

Rapid and robust analysis

The Zetium floor-standing XRF spectrometer is the workhorse for the cement industry and analyzes the composition of raw material, up to the final cement. Accuracy of the cement analysis is guaranteed by following the ASTM C114 norm as well as the ISO 29581-2 norm.



"Useful, fast analyses, [Zetium] is mandatory in daily operations." – Lafarge Cement S.A

Aeris Cement edition

Optimize cement production

This X-ray diffraction (XRD) system directly probes the mineralogical composition of cement and its intermediates. The mineralogical information allows you to judge the physical properties to better control the kiln when, for example, using alternative fuels. It additionally facilitates the quality assurance of (blended) cements. The Cement edition of Aeris is an easy-to-use and automatable benchtop XRD instrument for every cement plant.

“The intensity from Aeris is impressive; it helps to detect minor phases such as alkaline sulfates.”

– Major cement company (USA)



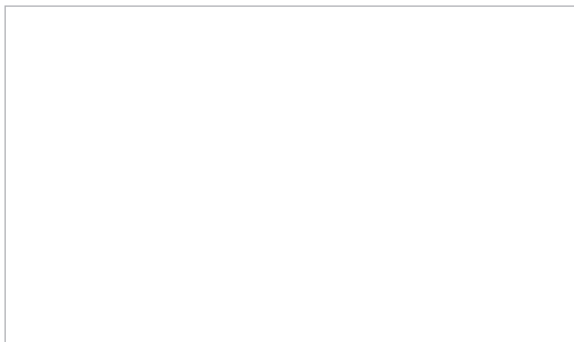
Epsilon 4

Improve your process efficiency through high-quality, low-cost elemental analysis

This benchtop X-ray fluorescence (XRF) spectrometer is used extensively for production and quality control for the elemental analysis of raw materials, alternative fuels and finished products.

Epsilon 4 provides state-of-the-art XRF analysis with outstanding analytical performance - comparable to floor-standing XRF instruments, but with a much lower cost of ownership.

Place the XRF spectrometer next to the production line and reduce your feedback time from hours to minutes. Epsilon 4 complies with the latest cement testing methods of both ASTM C114-15 and ISO 29581-2 in only 10 minutes.



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