Thermo Scientific Instrument Solutions for the Cement Industry

Optimize Your Process

Ensure Product Quality. Improve Plant Profitability. Reduce Waste.

Thermo SCIENTIFIC

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The Reasons to Pick Thermo Scientific Instruments Keep Piling Up

The world's largest, most innovative cement producers rely on Thermo Scientific instruments to ensure product quality, improve plant profitability and operate safer, cleaner plants. We are the preeminent provider in analytical spectroscopy, online elemental analysis, emissions monitoring instrumentation and tools for dynamic weighing and monitoring. Thermo Scientific, is the product brand representing the world's leading analytical instrumentation. Regardless of plant size and age, we offer solutions to help you meet your needs. Whether your goal is improving efficiency of your existing plant, building a new plant from the ground up, expanding capacity, converting from wet to dry process or implementing a productivity solution in just one part of your plant, we can help.

We provide a consultative approach with our portfolio of products. From technical evaluation to commissioning, our professionals offer decades of cement plant expertise.

Commitment to the Cement Industry

A company you can trust with products you can rely on. We want to help you improve cement quality, boost efficiency, lower production costs, reduce waste and create safer, cleaner production lines. We strive to supply products and services that reduce downtime and optimize your cement process. High fuel and electricity costs, quality requirements and a short-lived quarry are prime issues that require solutions. Our products aim to reduce variation, extend quarry life and decrease fuel and electricity costs. From the quarry to the finished product silos, we understand your process and offer products that suit your applications.

Lengthen the Life of Your Quarry

Today's cement producers face competitive challenges to maintain high quality standards, meet environmental pressures and operate cost efficient processes. One goal that cement plants strive for is consistent raw material quality with minimal chemistry deviation. Thermo Scientific products enable the cement producer to meet this goal. One European cement producer installed a Thermo Scientific crossbelt online analyzer after the primary crusher but before the pre-blending stockpiles. By doing so, this producer was able to reduce the stockpile-to-stockpile raw material variability by a factor of four.

This variability reduction had a direct effect on decreasing the amount of purchased corrective materials required later in the process and minimizing energy costs associated with variable raw materials.

Bonus:
With increased and timely awareness of the quarried material chemical composition, the producer was able to significantly reduce the amount of quarried materials that were previously wasted and instead use them in the process. This had a direct impact on lengthening the life of the quarry and minimizing costs associated with the purchase of outside raw materials.

The Right Equipment for the Right Application

X-Ray Fluorescence (XRF) analysis has become well established in the cement industry for elemental analysis as has X-Ray Diffraction (XRD) for the analysis of quartz in raw meal, free lime and key clinker phases (alite, belite, aluminate and ferrite). The implementation of these technologies in the cement industry helps facilitate control of kiln processes by providing information needed to continuously adjust parameters that stabilize the calcination and clinkerization process.

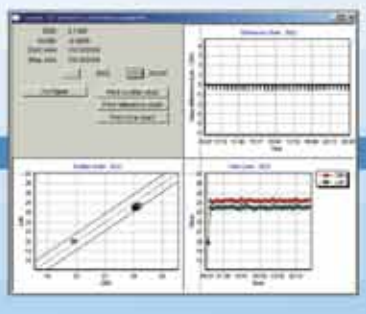
The array of Thermo Scientific X-ray analysis products allows the cement producer the flexibility to choose the right equipment for the right application.

Among others we can supply a unique X-ray analyzer which allows two X-ray techniques—XRF and XRD—to be integrated into one instrument. This system provides both elemental analysis and analysis of specific process-related phases all on the same sample. Information for raw-material screening, kiln control and cement quality control are done on a single instrument, saving time and capital costs.

Bonus:
Elemental analysis and phase analysis information, both from the Thermo Scientific X-ray analyzer, enables the cement producer to monitor, adjust and optimize the process for quality. A properly adjusted process and stabilized operation saves energy both at the kiln and during milling.

AccuLINK software connects the XRF analyzer in the lab to the online system in the field to ensure calibration of the online analyzer is validated and within specifications.

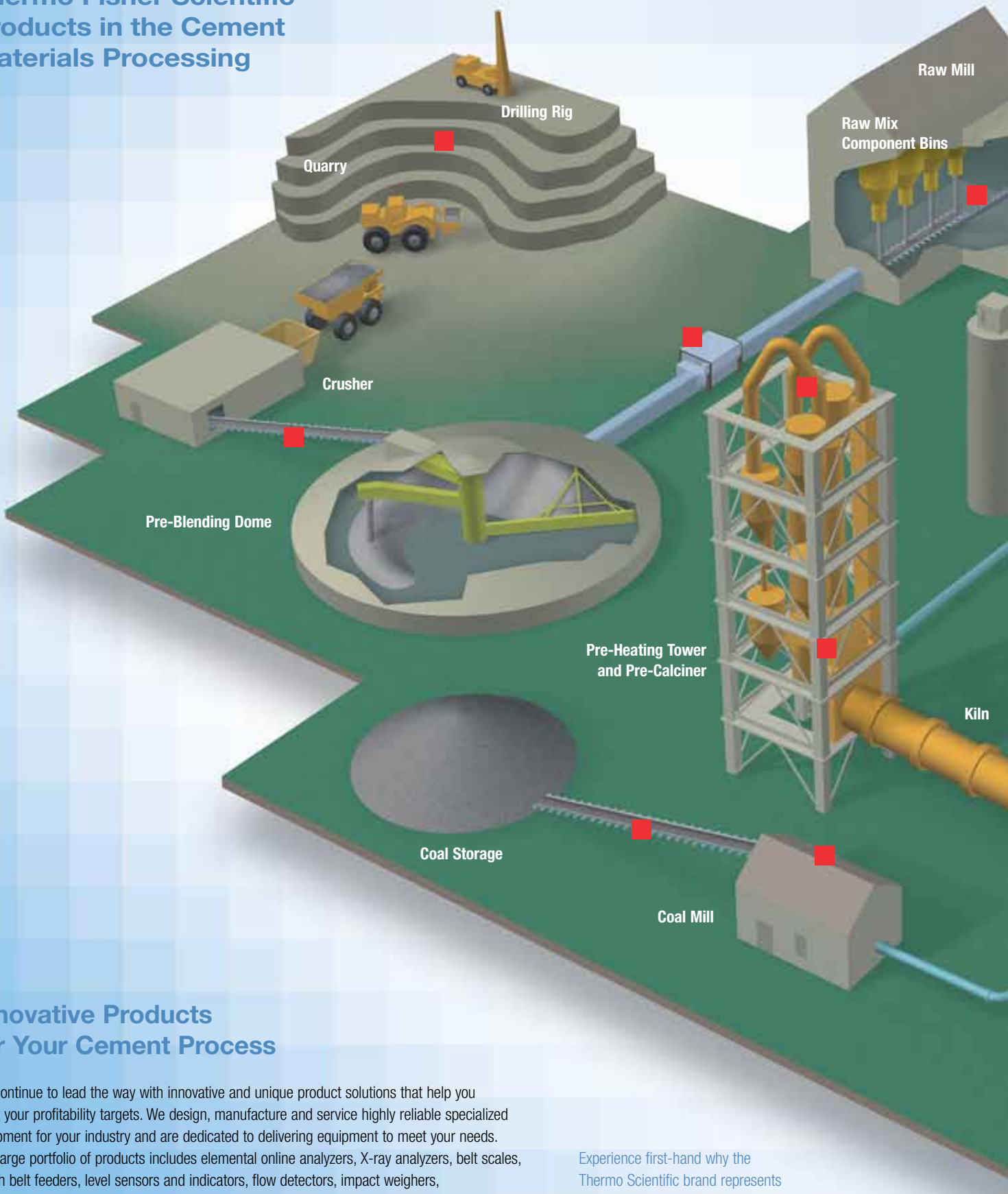
Cross-belt analyzer



AccuLINK software

Combined XRF-XRD spectrometer

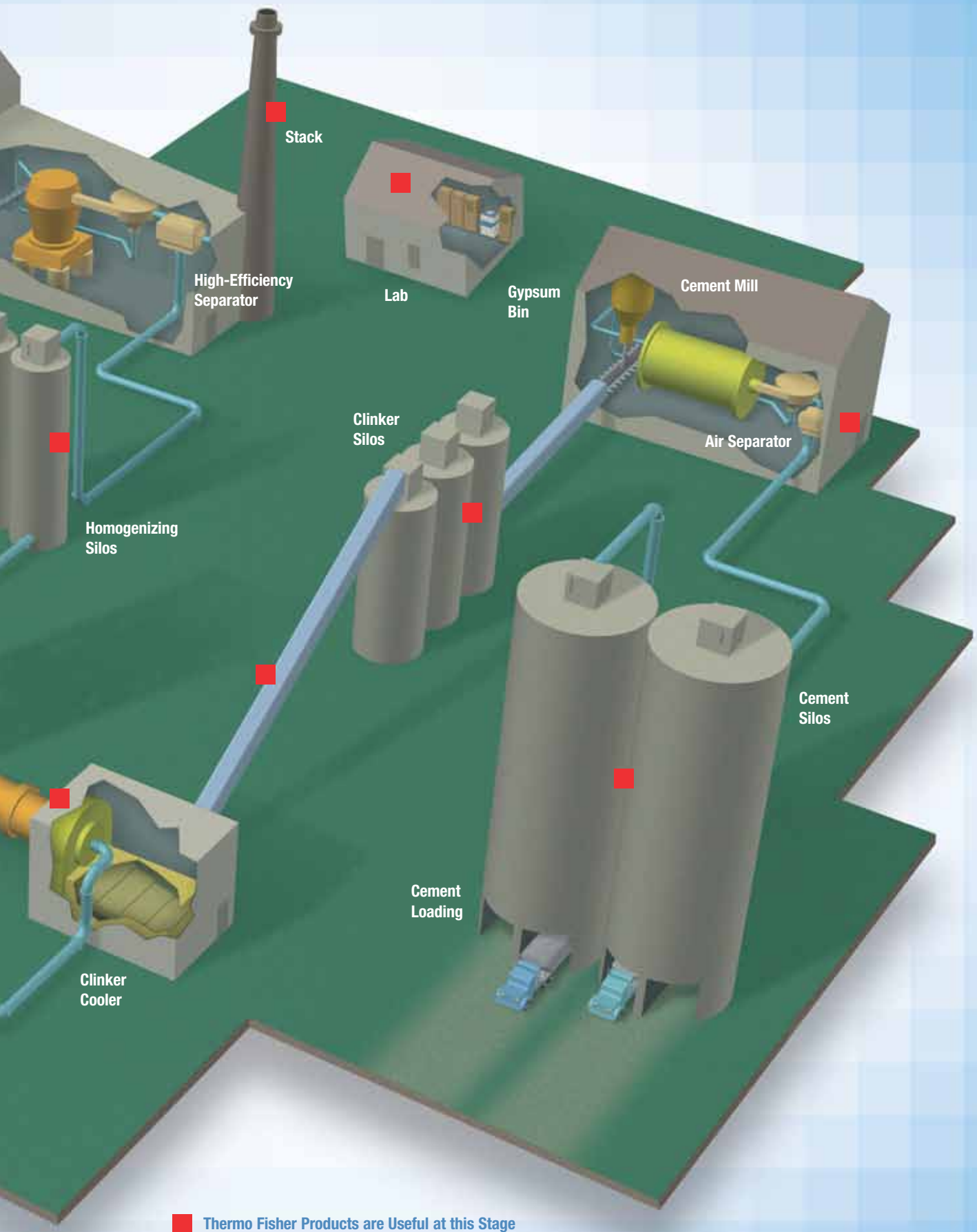
Thermo Fisher Scientific Products in the Cement Materials Processing



Innovative Products for Your Cement Process

We continue to lead the way with innovative and unique product solutions that help you meet your profitability targets. We design, manufacture and service highly reliable specialized equipment for your industry and are dedicated to delivering equipment to meet your needs. The large portfolio of products includes elemental online analyzers, X-ray analyzers, belt scales, weigh belt feeders, level sensors and indicators, flow detectors, impact weighers, stack emission gas detectors, material storage tracking software and more.

Experience first-hand why the Thermo Scientific brand represents the world's leading analytical instruments.



Thermo Fisher Products are Useful at this Stage

At the Quarry

- Analytics
  - Online PGNAA Analysis using both Isotopes or Neutron Generators for producing Neutrons
  - XRF/XRD Analysis of Quarry Materials such as Limestone, Clay, Marl, Bauxite and Iron Ores
  - Process Control Software for Stockpile Monitoring and Control
  - Laboratory Information Management Systems (LIMS)
- Weighing and Inspection
  - Tramp Metal Detection
  - Belt Scales
  - Weigh Feeders
  - Nuclear Density Gauges
- Belt Protection Equipment
  - Misalignment Switch Signals Belt Drift
  - Safety Pull Cord Switch
  - Belt Motion Detectors and Speed Indicators
  - Position Switches
- Sampling Systems
  - Sweep Samplers
  - Cross Stream Samplers
  - Multi Stage Sampling Systems
- Level and Flow Measurement
  - Capacitance Level Controls
  - Point Level Monitoring of Solids in Bins, Vessels and Chutes by means of Nuclear Technology, Tilt Switch or Microwave Technology
  - Nuclear Point or Continuous Level Switches
  - Point Level Switch for High Level Alarms and Spill Prevention
  - Plumb Bob Level Sensors
  - Strain Gauges
- Tripper Position Monitor
- MSHA Approved Personnel Dust Exposure Monitors

At the Plant

- Analytics
  - Online PGNAA Analysis
  - Online Slurry Analysis
  - XRF/XRD Analysis of Raw Meal for Blending Control, Clinker and Cement Products
  - Quartz in Raw Meal
  - Hot Meal Decarbonatation Level
  - XRD Analysis of Free Lime and Clinker Phases in Clinkers
  - CaF_2 in Clinker
  - Various Additions in Cement, e.g. Limestone, GBFS, Pozzolan
  - Clinker Content in Cement
  - Analysis of Alternative Fuels, Incineration Products and Non-Routine Samples
  - Process Control Software for Automatic Raw Mix Proportioning
  - Laboratory Information Management Systems (LIMS)
  - Process Gas Analysis (NOx, SOx, CO, etc.)
  - Continuous Emissions Monitoring (NOx, SOx, CO, etc.)
  - Stack Gas Sampling Probes
  - Ambient Gas Monitors
  - Personnel Gas Monitors
  - Particulate Monitors
  - Radiation Monitoring and Measurement Equipment
  - Water Analysis
- Weighing and Inspection
  - Tramp Metal Detection
  - Monitoring Production Output with Belt Scales
  - Weigh Feeders
  - Impact Flow Meters
  - Loss-in-weight Feeders
  - Nuclear Density Gauges
- Belt Protection Equipment
  - Misalignment Switch Signals Belt Drift
  - Safety Pull Cord Switch Alerts Equipment Circuits of a Stop Condition
  - Belt Motion Detectors and Speed Indicators
  - Position Switches
- Sampling System
  - Sweep Samplers
  - Cross Stream Samplers
  - Multi Stage Sampling Systems
- Level and Flow Measurement
  - Capacitance Level Indicators
  - Rotary Level Controls
  - Nuclear, Continuous or Point Level Systems
  - Ultrasonic Level Detectors
  - Plumb Bob Level Sensors
  - Strain Gauges
- Tripper Position Monitor
- MSHA Approved Personnel Dust Exposure Monitors
  - Radiation Level Indicators
  - AQI Fixed Gas Monitors
- Data Display and Acquisition Instrumentation
  - Archiving
  - Alarming
  - Historical Graphing

Research Laboratories

- X-Ray Diffraction (XRD)
- X-Ray Fluorescence (XRF)
- Inductively Coupled Plasma
- Laboratory Information Management Systems (LIMS)
- Mass Spectrometry

The Products

Process Control Solutions

Online Bulk Material Analysis and Control

Measuring and managing raw material quality in a cement process can be quite challenging. The Thermo Scientific cross-belt series of online analyzers integrate directly into a new or existing conveyor belt and determine the elemental composition of all the raw materials being transported by conveyor, eliminating errors and costs associated with material sampling. Pre-blending stockpile and raw mix optimization software work in conjunction with the analyzer to achieve consistent composition, meet quality targets, minimize raw mix variability and improve kiln efficiency. The Thermo Scientific CB Omni utilizes a new, high efficiency detector design that can be tailored to meet your exact needs, providing superior analytical performance. What's more, this unique cross-belt analyzer installs on the conveyor line without cutting the structure and it is compact enough to fit into locations with limited space. Additionally, online coal analyzers from Thermo Fisher are occasionally employed in cement plants to ensure the CV or BTU value of the coal being fed into the kiln is in accordance with quality standards to reduce fuel consumption.

The Thermo Scientific CB Omni Flex Analyzer uses Prompt Gamma Neutron Activation Analysis (PGNAA) or Pulsed Fast and Thermal Neutron Analysis (PFTNA) to determine in real time the elemental composition of the material conveyed on a conveyor. The CB Omni Flex analyser incorporates a unique provision to accommodate either the spontaneously fissioning isotope californium-252 (Cf-252) or an electronic neutron generator as a source of neutrons.

Eliminate the use of cabling with a Thermo Scientific Wireless Xpert system. It connects instrumentation in the field, such as an online analyzer, to Operator Consoles (OpCons) as well as to mobile terminals wirelessly. Our Thermo Scientific Material Storage Tracking Software (MSTS) runs on a OpCon and gives the operator an analysis of raw material conveyed to downstream bins or material storage bays. Reduce kiln feed variability and kiln upsets through efficient, accurate raw mix proportioning. AccuLINK software connects the XRF analyzer in the Lab to the online system in the field to ensure calibration of the online analyzer is validated and within specifications.

Thermo Scientific analytical and quality control solutions help to increase productivity and reduce manufacturing costs. Why not complement our analytical solutions with our material handling products as well?

Material Handling

We offer a variety of measurement, monitoring and control equipments both at the cement quarry and in the plant. Products available include belt scales, weigh feeders, conveyor safety switches and sampling equipment. Thermo Scientific weigh belt feeders accurately control process material feed rates. Whether it is raw material for raw mix proportioning or coal for the kiln, we have the right feeder for your application offering rugged and reliable performance for the long haul. Our loss-in-weight feeders are an excellent choice for dry, dusty or variable density materials. These robust systems provide accurate feed by measuring and adjusting the rate of change of the material weight out of an integrated hopper. Our impact weighing systems are ideal for measuring, monitoring or controlling material in a vertical flow stream and our high quality belt scale systems measure material flow rates on a conveyor allowing you to manage production output and inventory.

Impact Flow Meter

CB Omni

High Capacity
Weighbelt Feeder

Belt Scale

CB Omni Flex

Prevent damage of expensive downstream equipment from tramp metal on conveyor belts with Thermo Scientific tramp metal detectors; identify bucket teeth, manganese steel mantles, bore crowns, bar scrap chains, tools and more. Additional products such as conveyer switches and plugged chute detectors protect personnel and valuable equipment and keep your downtime to a minimum.

Level, Density and Flow Measurement

Prevent bin overflows, plugged chutes and empty bins with Thermo Scientific level sensors. Continuous level measurement devices use the lowest frequencies on the market to penetrate dust, steam, vapors and other harsh environmental obstacles to provide precise and reliable readings. Microwave or Nuclear point level switches can monitor the silo or bin level above the weighfeeder and stop the system, close a valve or gate situated above the weighfeeder to ensure consistent material feed to the system.

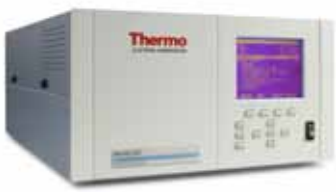
We also offer microwave-based, non-contact flow sensors for monitoring solid flows in pipelines, ducts, air slides and at transfer points. Choose our density gauge, in wet cement processes, to measure density of raw meal, kiln feed, cement or slurry in the process stream with rugged, accurate gamma attenuation technology.

Emissions and Personnel Safety Monitoring

Regulatory entities are increasingly implementing standards and setting requirements for monitoring and reporting data on plant emissions. And, in order to improve efficiency throughout a cement manufacturing process and meet the needs of sustainable development goals, the industry is finding an increased need for robust, reliable and accurate gas analysis methods. We build turnkey Continuous Emissions Monitoring Systems (CEMS) and can provide gas analysis instrumentation to meet your process gas analysis needs, including analysis for gaseous mercury. Guaranteed to meet U.S. EPA performance specifications, our Thermo Scientific CEMS systems are designed for maximum data capture, minimum maintenance and minimum spare parts consumption. Our commitment to gas analysis technology also includes a wide array of portable and personnel gas monitors.

Informatics

Thermo Scientific Laboratory Information Management solutions allow you to integrate your laboratory data and online process data to create an integrated information system. This results in complete real-time visibility to all aspects of plant performance, allowing you to maximize efficiency while ensuring production quality.



Gas Analyzer

Loss-in-weight Feeder

Continuous Level Measurement System

Continuous Gamma Level Measurement System

Tramp Metal Detector

Elemental and Phase Analysis in the Laboratory

X-ray spectrometry is a common and very powerful technique for fast quantitative analysis of major, minor and trace components of the raw materials used in the cement manufacturing process as well as the properties of finished product. We provide a full range of X-ray fluorescence (XRF) and X-ray diffraction (XRD) instrumentation. Each instrument combines leading-edge technology with a long history of quality, durability and exceptional analytical performance.

One Thermo Scientific system uses proprietary technology to combine both XRF and XRD techniques into one instrument and has become a reference system in the cement industry thanks to its analytical power and flexibility. In addition to the conventional chemical analysis from raw material through clinker to final cement and related products, this unique technology is capable of analyzing the most important and useful phases for process control: quartz in raw meal, hot meal, free lime in clinkers and clinker phases such as alite, belite, aluminate and ferrite. This innovative instrument can also monitor various additions in cement, such as limestone, GBFS and pozzolan. Alternatively even clinker content in cement can be controlled.

The low power wave wavelength dispersive X-ray fluorescence (WDXRF) systems at 50W and 200W were specifically developed for small size cement plants and grinding stations and also serves as a back-up to the main stream instrument in big cement plants.

The cement industry is also burning a variety of alternative fuels or waste products in its kilns. Due to their intrinsic heterogeneity and complex matrix variations, it is difficult to set up specific calibration programs to analyze such samples. Energy dispersive X-ray fluorescence (EDXRF) is one of the most suitable techniques for handling such applications, and our high performance EDXRF spectrometer instrument perfectly fulfills this analytical demand in a cement laboratory. It is capable of handling difficult and dirty samples of unknown origin, in most cases as received or with very little sample preparation.

Thermo Scientific X-ray instruments are well positioned to meet the current and future analytical requirements of the modern cement industry.

High Power Advanced Sequential WDXRF

XRF-XRD Analyzer

Low Power WDXRF

Benchtop EDXRF

Product Support

Service and Training

Your operations will benefit from a comprehensive service offering including installation and maintenance, calibration, training and repair aimed at reducing down time and keeping your process working. We offer multiple levels of product support agreements and repair services to meet the needs of your operation around the globe. We offer field service repair or depot repair on many of our products with options that fit your budget and your deadline.

We also offer a comprehensive selection of training options to help you increase productivity by optimizing the use of your products and expanding the skills of your operators. You can receive hands-on instruction in your plant or one-on-one instruction at our training facilities in the U.S or Europe. Courses typically cover basic operation, theory, calibration, and routine user level maintenance, but can include circuit board level troubleshooting and certification, if required.

Our spare parts are designed specifically for your Thermo Scientific system, and we make it easy for you to secure replacements by maintaining offices around the world that respond quickly to your phone or online request.

ISO 9001 REGISTERED COMPANY *Thermo Fisher Scientific Ecublens SARL, Switzerland is ISO Certified.*

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