

ARL PERFORM'X Cement Analyzer XRF Spectrometer

Key Features

- Outstanding repeatability and stability thanks to temperature regulation of spectrometer and crystals
- Direct and simple introduction of the sample
- Speed of analysis with dual sample loading
- Dust collection device for safety and stability
- Fast high-precision goniometer
- Optimized collimator-crystal combinations providing resolution and sensitivities
- Tube shield (optional) for the ultimate X-ray tube protection



Introduction

X-ray fluorescence (XRF) analysis is the most widely used technique for chemical composition of cements and raw materials. It is the main workhorse of the cement plant laboratory, providing important information on the chemical makeup of a given sample. It is an essential quality control tool, used to assure the proper composition of the initial cement raw material blends and of the final product. XRF not only has the ability to provide highly accurate data on the amounts of major cement oxides such as CaO, SiO2, Al2O3, and Fe2O3 but can also give chemical analysis on the chloride and alkali composition, which is used in evaluation of alternate raw materials and to map quarries. XRF results also are vital in assessing and troubleshooting problems. Often it is the first step in evaluating burnability and can be used to help identify causes of problems such as buildups, contamination, and discoloration. The Thermo Scientific[™] ARL[™] PERFORM'X XRF Cement Analyzer Spectrometer is an ideal cost-effective solution for these types of analysis.

Instrument

The ARL PERFORM'X cement analyzer has been configured with only the essentials for the analysis of cement. The instrument is equipped with two crystals (AX06 and Ge111), one collimator, and one detector (FPC).

This affordable configuration enables the analysis of all elements ranging from F to Fe. Two power levels are available (1500 W and 2500 W) which both operate without an external water chiller. The ARL PERFORM'X cement analyzer also allows for field upgrades (crystals or detector) to meet any specification, as do all other ARL PERFORM'X systems.

As can be seen from the below tables the required performance for cement industry will be easily reached within a minute of analysis or less. At 2500 W, less than

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4 second counting time per element is necessary and at 1500 W, 2 to 10 seconds, depending on the element, will be sufficient.

Instrument control and data handling

The powerful and user-friendly Thermo Scientific™ OXSAS

X-Ray Fluorescence Analysis Software supports spectrometer operation and data handling. Its advanced design ensures that the OXSAS platform evolves to meet customers' needs, providing up-to-date solutions throughout the entire lifespan of the XRF instrument.

More on www.thermofisher.com/oxsas

ARL PERFORM'X 2500W Cement Analyzer

Elements		CaO	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	SO₃	MgO	Na₂O	K₂O	P_2O_5	MnO	Cr₂O₃	TiO ₂
Average	Conc. %	62.490	20.900	5.150	2.880	2.110	3.330	0.1500	0.4100	0.0800	0.2900	0.0900	0.3100
SD	2 sec	0.0250	0.0280	0.0130	0.0100	0.0040	0.0150	0.0040	0.0020	0.0020	0.0030	0.0020	0.0070
SD	10 sec	0.0200	0.0100	0.0060	0.0040	0.0010	0.0050	0.0010	0.0010	0.0010	0.0010	0.0010	0.0030
Required SD		0.0300	0.0200	0.0200	0.0100	0.0200	0.0200	0.0150	0.0200	0.0100	0.0100	0.0050	0.0150

ARL PERFORM'X 1500W Cement Analyzer

Elements		CaO	SiO ₂	AI_2O_3	Fe ₂ O ₃	SO₃	MgO	Na₂O	K₂O	P_2O_5	MnO	Cr₂O₃	TiO ₂
Average	Conc. %	62.490	20.900	5.150	2.880	2.110	3.330	0.1500	0.4100	0.0800	0.2900	0.0900	0.3100
SD	2 sec	0.0450	0.0350	0.0190	0.0140	0.0060	0.0160	0.0080	0.0030	0.0025	0.0031	0.0025	0.0091
SD	10 sec	0.0320	0.0140	0.0090	0.0070	0.0030	0.0050	0.0018	0.0019	0.0007	0.0020	0.0014	0.0032
Required SD		0.0300	0.0200	0.0200	0.0100	0.0200	0.0200	0.0150	0.0200	0.0100	0.0100	0.0050	0.0150

Analytical configuration

Element/oxide	Analytical line	Crystal	Detector
CaO	Κα	Ge111	FPC
SiO ₂	Κα	AX06	FPC
Al ₂ O ₃	Ка	AX06	FPC
Fe ₂ 0 ₃	Κα	Ge111	FPC
S	Κα	Ge111	FPC
MgO	Ка	AX06	FPC
Na ₂ O	Κα	AX06	FPC
K ₂ O	Κα	Ge111	FPC
P ₂ O ₅	Κα	Ge111	FPC
MnO	Κα	GE111	FPC
Cr ₂ O ₃	Κα	Ge111	FPC
TiO ₂	Κα	GE111	FPC
F	Ка	AX06	FPC

Specifications for ARL PERFORM'X cement analyzer

- FFe goniometer covers F to Fe with:.
 - 9-position crystal changer with 2 crystals fitted: AX06 & Ge111
 - 2-position detector system with 1 detector fitted: flow proportional counter
- Vacuum system with rotary pump
- Either 1500-watt or 2500-watt power supply Rh target X-ray tube with 75 µm window
- Air to water heat exchanger
- 1 position for manual loading of samples
- Capability for Tech Connect modem connection (remote diagnostic)
- One set of quality assurance monitor samples
- Pre-calibration for cement (as pressed pellets) with relevant setting-up samples
 - Note: no standard samples are delivered with this calibration.

Specifications for ARL PERFORM'X cement analyzer

Crystals - Up to 7 additional crystals can be added for increased elemental analysis capabilities

Sample changer – The ARL PERFORM'X spectrometer can be fitted with the standard XY sample manipulator for up to 65 cassettes or 112 samples

Detector - Scintillation detector can be added for increased element coverage



