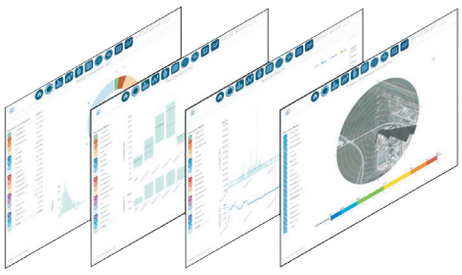
Xact® 625i Ambient Multi-Metals Monitoring System

COOPER ENVIRONMENTAL
A DIVISION OF SCI

Ambient/Fence-Line Multi-Metals Monitor



ADAPT Screenshots

Description

Cooper Environmental's Xact® 625i is designed for high time resolution multi-metals monitoring of ambient air, with detection limits that rival those of laboratory analysis. The Xact® 625i comes standard with a solid-state meteorological sensor and Cooper Environmental's proprietary ADAPT analysis package, making the instrument one of the most powerful air pollution source detection offerings in the industry.

The system uses reel-to-reel filter tape sampling and nondestructive energy dispersive X-ray fluorescence (EDXRF) analysis. The air is sampled through a low volume (16.7 l/min) particulate matter (PM) size-selective inlet and drawn through a filter tape. The resulting PM deposit is then advanced into the analysis area where the sample is analyzed by EDXRF for selected metals while the next sample is collected.

Standard Features

- ADAPT data analysis software that enables immediate research quality graphical reports to deliver unique insight on the temporal and variability trends of the metals measured
- Sampling and analysis methodology that has been validated by the US EPA ETV program
- Windows-based operating system with 10.1 inch touchscreen that may be ordered flat (shown) or tilted for lower placed instruments
- Sampling, analysis, and near real-time reporting (every 15, 30, 60, 120, 180, or 240 minutes in ng/m^3)
- Automatic quality assurance, alarms, & control features
- Incorporates an internal XRF quality assurance standard with every sample analyzed
- Provides automatic, daily XRF calibration drift checks
- Remote polling and remote system control
- Global power design does not require power conversion or conditioning
- Average detection limits improved by over 30% compared to previous generation Xact® 625

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Benefits

- Adaptable to both stationary and mobile monitoring platforms
- Effective for fugitive emissions measurement
- Can be used to establish baseline levels for health-based standards
- Capable of identifying hazardous "hot spots" around the perimeter of a facility
- Enables effective source apportionment and chemical mass balance comparisons
- Highly sensitive and reliable (low pg/m3 to µg/m3 range)
- Nondestructive analysis allows for sample archiving
- Aids source identification by correlating metals concentrations to wind speed and direction
- Demonstrates metal concentration variability not observable with standard 24-hour methods
- Can be used to identify plant activities associated with high metals concentrations

Applications

The Xact® 625i monitoring system can simultaneously identify and measure multiple metals in ambient air to provide data for use in the following applications:

- Fence-line monitoring
- Source Apportionment
- Determination of background concentrations
- Spatial recognition of pollution sources
- Temporal recognition of pollution sources
- Resolve acute, short duration events
- Continuous measurement of industrial work areas

Specifications

Measurement method	Based on EPA Method IO 3.3: Determination of Metals in Ambient PM Using XRF
Key applicable elements	Sb, As, Ba, Cd, Ca Cr, Co, Cu, Fe, Pb, Hg, Mn, Ni, Se, Ag, Sn, Ti, Tl, V, Zn, and more available
Measurement range	Up to 60 µg/dscm and higher
Detection limits (IF, EPA IO - 3.3)1	Metal and sample time dependent; refer to the minimum detection limit (MDL) data
Sampling and analysis times	Every 15, 30, 60, 120, 180, or 240 minutes, user defined
Calibration stability check frequency	Automatically with each sample analyzed
Estimated recalibration frequency	Annually, when manufacturer's operating recommendations are followed
Sample flow rate	16.7 lpm
Linearity	Correlation coefficient >0.99
Size and weight	19" w x 20" d x 30" h 130 lbs 19 inch (483 mm) rack-mountable or tabletop
Required operating environment	Lab environment with temperature controlled to 20±5°C (68°F)
Power requirements	120 VAC/60 Hz @ 20 amp or 220 VAC/50 Hz 10 amp circuit
Outputs	S232 Modbus protocol Reporting of all metals that the system is calibrated to measure
Options	Change or add elements Enclosures (NEMA 4, 4x, 12, or 12x) Inlets (PM10, PM2.5, PM1, low volume TSP)

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Performance

Xact 625i Minimum Detection Limits (ng/m³)
68% Confidence Level per US EPA IO 3.3 and Currie *

Element	Atomic Number	Sample Time (Min)					
		15	30	60	120	180	240
Al	13	840	290	100	35	19	12
Si	14	150	51	17.8	6.3	3.4	2.2
P	15	44	15	5.2	1.8	0.99	0.64
S	16	26	9.1	3.16	1.1	0.60	0.39
Cl	17	15	5.0	1.73	0.61	0.33	0.21
K	19	9.8	3.4	1.17	0.41	0.22	0.14
Ca	20	2.5	0.86	0.30	0.10	0.057	0.037
Ti	22	1.3	0.46	0.16	0.056	0.030	0.020
V	23	1.0	0.34	0.12	0.042	0.023	0.015
Cr	24	0.97	0.33	0.12	0.041	0.022	0.014
Mn	25	1.2	0.41	0.14	0.050	0.027	0.018
Fe	26	1.4	0.49	0.17	0.061	0.033	0.021
Co	27	1.1	0.39	0.14	0.049	0.026	0.017
Ni	28	0.78	0.27	0.10	0.034	0.018	0.012
Cu	29	0.65	0.23	0.079	0.028	0.015	0.010
Zn	30	0.55	0.19	0.067	0.023	0.013	0.008
As	33	0.52	0.18	0.063	0.022	0.012	0.008
Se	34	0.66	0.23	0.081	0.029	0.016	0.010
Br	35	0.85	0.30	0.10	0.037	0.020	0.013
Ag	47	16	5.5	1.9	0.68	0.37	0.24
Cd	48	21	7.2	2.5	0.89	0.48	0.31
In	49	26	8.9	3.1	1.1	0.60	0.39
Sn	50	33	12	4.1	1.4	0.78	0.51
Sb	51	42	15	5.2	1.8	0.99	0.64
Ba	56	3.3	1.1	0.39	0.14	0.074	0.048
Hg	60	0.99	0.35	0.12	0.043	0.023	0.015
Tl	81	0.95	0.33	0.12	0.041	0.022	0.014
Pb	82	1.0	0.36	0.13	0.045	0.024	0.016
Bi	83	1.1	0.37	0.13	0.046	0.025	0.016

* - Interference free one sigma detection limits or "…net signal level (instrument response) above which an observed signal may be reliably recognized as "detected" (Currie, 1968). See www.cooperenvironmental.com for more details on detection limits.

US EPA Compendium of Methods for the Determination of Inorganic Compounds in Ambient Air, June 1999: Method IO-3.3.

US EPA XRF Web Seminar, Module 2: Basic XRF Concepts, August 2008.

Currie, L. A., "Detection and Quantification in X-Ray Fluorescence Spectometry" in T. G. Dzubay, X-ray Fluorescence Analysis of Environmental Samples, Ann Arbor Science, 1977; and L. A. Currie, Analytical Chemistry, 40, p586, March 1968.

Detection limits above are for 0.707 in2 spot sample size

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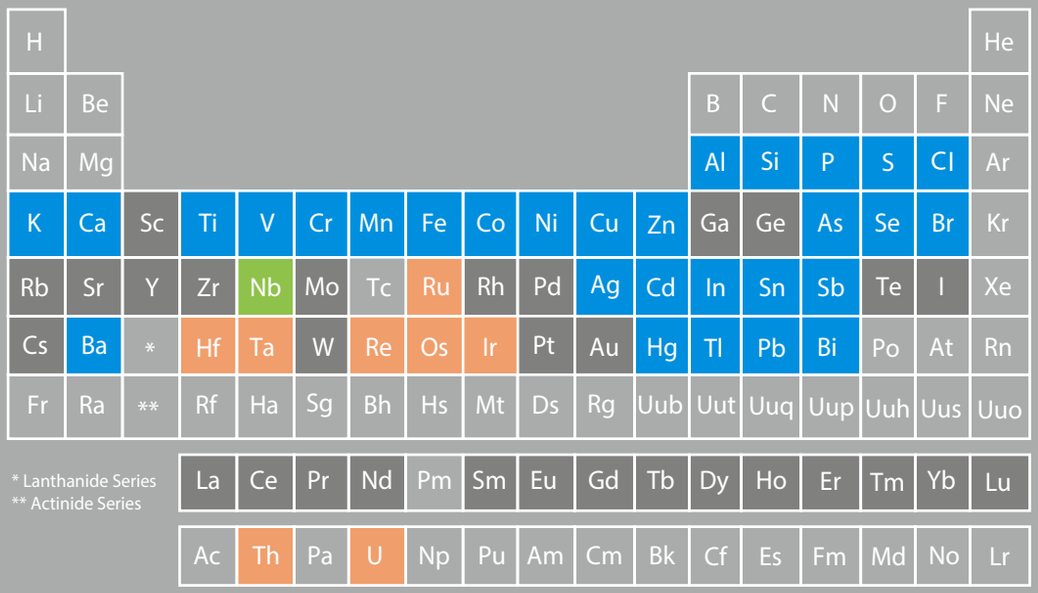
Element can be measured with MDLs published

Element can be measured, but MDLs are not published

Element can be measured, but standards are not commercially available

Element used for QA, not available for aerosol measurement



Elements Supported

Xact® 625i monitoring systems are capable of identifying and measuring the 67 elements highlighted in the table above. Minimum detection limits for the elements highlighted in blue can be found on the performance page of this data sheet. The Xact® 625i can measure elements highlighted in gray, but detection limit data has not been published for these elements. Please contact your Xact® representative for more information on your specific metals monitoring requirements.

As a "standard" set of elements of interest, the 625i will be equipped to report the following 44 elements - Al, Si, P, S, Cl, K, Ca, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Se, Br, Rb, Sr, Y, Zr, Mo, Pd, Ag, Cd, In, Sn, Sb, Te, Cs, Ba, La, Ce, W, Pt, Au, Hg, Tl, Pb, and Bi. Of course, the elements can be tailored specifically to the user's needs as well.

Ordering Information

To place an order or for more information about the Xact® 625i continuous monitoring system, contact your regional CES representative or email us at info@cooperenvironmental.com.

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