



Ambient/ Fence-Line Metals Monitor (AMM)



Description

Cooper Environmental Services Xact™ 625 is designed for monitoring metals in ambient air, air near the fence lines of industrial facilities, and in complex urban environments, where particulate matter and metal concentrations are elevated.

The system uses reel-to-reel (RTR) filter tape sampling and nondestructive X-ray fluorescence (XRF) analysis. The air is sampled through a 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 XRF for selected metals while the next sample is collected.

Sampling and analysis are performed continuously and simultaneously, except during advancement of the tape (~20 sec) and during daily-automated quality assurance checks.

Features

- Sampling, analysis, and near real-time reporting (every 15, 30, 60, 120, 180, or 240 minutes in ng/m^3)
- Detection limits as low as $0.014 \text{ ng}/\text{m}^3$ (using four hour sampling times)
- Automatic quality assurance, alarms, & control features
- Proven RTR/XRF technology demonstrated on the ocean floor, Mars, and in thousands of beta attenuation monitors
- Identification and measurement of as many as 24 elements simultaneously. (Refer to the periodic table on the Elements Supported page of this data sheet.)
- Incorporates an internal XRF Quality Assurance standard with every sample analyzed
- Provides automatic, daily XRF upscale, and flow checks

Benefits

- Adaptable to both stationary and mobile monitoring platforms
- Area and 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
- Can be used to correlate metals to wind speed and direction
- Can be used to demonstrate metal concentration variability not observable with standard 24-hour reference methods

Applications

- The Xact 625 monitoring system can simultaneously identify and measure multiple metals in ambient air to provide data for use in the following applications.
- Fence-line monitoring
- Chemical Mass Balance/Source Apportionment
- Determination of background concentrations
- Spatial recognition of pollution sources
- Temporal recognition of pollution sources
- Resolve acute, short duration events
- Risk and emergency management

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) ²	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 (2 cabinets).	2’ w x 2’ d x 4’ h 130 lbs 19 inch (483 mm) rack-mountable components
Required operating environment.	Lab environment with temperature controlled to 20±3°C (68°F)
Power requirements ³	120 VAC/60 Hz @ 20 amp circuits 220 VAC/60 Hz 10 amp with an optional power converter
Outputs.	RS232 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, TSP) Remote control Remote polling

²Detection limits are interference free to 1 sigma

³To maintain a factory warranty or service agreement, the power must be conditioned to specifications.

Minimum Detection Limits (ng/m³)

Element	Atomic Number	Sampling Time (min)					
		15	30	60	120	180	240
K	19	18.93	6.69	2.37	0.84	0.46	0.30
Ca	20	7.22	2.55	0.90	0.32	0.17	0.11
Ti	22	3.04	1.07	0.38	0.13	0.07	0.05
V	23	2.32	0.82	0.29	0.10	0.06	0.04
Cr	24	2.31	0.82	0.29	0.10	0.06	0.04
Mn	25	2.26	0.80	0.28	0.10	0.05	0.04
Fe	26	6.07	2.15	0.76	0.27	0.15	0.09
Co	27	2.53	0.90	0.32	0.11	0.06	0.04
Ni	28	1.81	0.64	0.23	0.08	0.04	0.03
Cu	29	2.14	0.76	0.27	0.09	0.05	0.03
Zn	30	1.85	0.65	0.23	0.08	0.04	0.03
Ga	31	0.87	0.31	0.11	0.04	0.02	0.01
Ge	32	0.97	0.34	0.12	0.04	0.02	0.02
As	33	0.92	0.32	0.11	0.04	0.02	0.01
Se	34	1.12	0.40	0.14	0.05	0.03	0.02
Br	35	1.48	0.52	0.18	0.07	0.04	0.02
Rb	37	2.75	0.97	0.34	0.12	0.07	0.04
Sr	38	3.58	1.27	0.45	0.16	0.09	0.06
Y	39	4.33	1.53	0.54	0.19	0.10	0.07
Mo	42	7.85	2.77	0.98	0.35	0.19	0.12
Ag	47	34.62	12.24	4.33	1.53	0.83	0.54
Cd	48	45.98	16.26	5.75	2.03	1.11	0.72
In	49	54.20	19.16	6.77	2.40	1.30	0.85
Sn	50	59.64	21.09	7.46	2.64	1.43	0.93
Sb	51	5.31	1.88	0.66	0.23	0.13	0.08
Ba	56	7.56	2.67	0.95	0.33	0.18	0.12
Pt	78	1.83	0.65	0.23	0.08	0.04	0.03
Au	79	1.84	0.65	0.23	0.08	0.04	0.03
Hg	80	1.51	0.53	0.19	0.07	0.04	0.02
Tl	81	1.47	0.52	0.18	0.07	0.04	0.02
Pb	82	1.75	0.62	0.22	0.08	0.04	0.03
Bi	83	1.90	0.67	0.24	0.08	0.05	0.03

H																		He
Li	Be											B	C	N	O	F		Ne
Na	Mg											Al	Si	P	S	Cl		Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br		Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I		Xe
Cs	Ba	*	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At		Rn
Fr	Ra	**	Rf	Ha	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut	Uuq	Uup	Uuh	Uus		Uuo
			La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb		Lu
			Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No		Lr

* Lanthanide Series
** Actinide Series

Elements Supported

Xact 625 monitoring systems are capable of identifying and measuring the 65 elements highlighted in the table below. Minimum detection limits for the elements highlighted in blue can be found on the performance page of this data sheet. The Xact 625 can measure elements highlighted in gray, but detection limit data has not been developed for these elements. Please contact your Xact representative for more information on your specific metals monitoring requirements.

Ordering Information

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