COOPER ENVIRONMENTAL

Multi-Metals Continuous Emissions Monitoring System (CEMS)

Description

Cooper Environmental's Xact® 640 system uses reel-to-reel filter tape sampling and nondestructive energy dispersive X-ray fluorescence (EDXRF) analysis to monitor stack HAP metal emissions. An isokinetic sub-sample of stack gas is taken from the stilling chamber and drawn through a chemically reactive filter tape. Vapor phase metals, including mercury (Hg), are deposited along with the particulate matter (PM) on the filter tape.

The deposit is automatically advanced and analyzed by XRF for selected metals as the next sample is being collected. Sampling and analysis are performed continuously and simultaneously, except during advancement of the tape (~20 sec) and during daily-automated quality assurance checks.

In 2007, through its Clean Air Excellence Award, the EPA recognized the Xact® 640 as an outstanding achievement in innovative clean air technology. The EPA also approved the Xact® 640 CEMS as an lternative method for periodic Method 29 testing and feed stream analysis, as well as for monitoring emissions during plant operation.

Features

- Automatic quality assurance, alarms, and control features
- Gas phase calibration not required
- Identification and measurement of as many as 23 elements simultaneously (refer to the periodic table on the Elements Supported page of this data sheet)
- Internal calibration check incorporated with every sample analyzed
- Proven RTR/XRF technology demonstrated on the ocean floor, Mars, and in thousands of beta attenuation monitors
- Daily, automatic upscale, blank, and flow checks
- Recognized by the EPA as an innovative clean air technology (Clean Air Excellence Award, 2007)
- Sampling, analysis, and near-real-time reporting (every 15, 30, 60 and 120 minutes)

Benefits

- Single monitor platform for Hg and HAP metals monitor compliance
- No PM monitor needed to comply with MATS
- May be used to meet 40 CFR Part 60 and 63 regulations
- Measures total mercury in µg/dscm
- Multi-metal analysis reduces expenses, time, and resources
- Non-destructive analysis allows for sample archiving
- Sensitive and reliable (ng/m3 to µg/m3 range)

Applications

The Xact® 640 monitoring system can simultaneously identify and measure multiple metals in flue gas to provide data for use in the following applications.

- Hg CEMS
- HAP metals CEMS
- Baselining a new process
- Optimization of emission controls
- Permitting
- Regulatory compliance
- Risk 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	Demonstrated up to 1963 µg/dscm
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 minutes, depending on the per sample mass
Calibration stability check frequency	Automatically with each sample analyzed
Estimated recalibration frequency	Annually, when manufacturer's operating recommendations are followed
Sample flow rate	TBD
Linearity	Correlation coefficient >0.98
Size and weight (2 cabinets)	19 inch w x 24 inch d x 19 inch h and 19 inch w x 24 inch d x 35 inch h 180 lbs 483 mm rack-mountable components
Required operating environment	Lab environment with temperature controlled to 20±3°C (68°F)
Power requirements[2]	120 VAC/60 Hz @ 2-20 amp circuits 220 VAC/60 Hz 20 amp with an optional power converter
Outputs	TBD All metals that the system is calibrated to measure will be reported
Options	Change or add elements Enclosures Remote control Remote polling

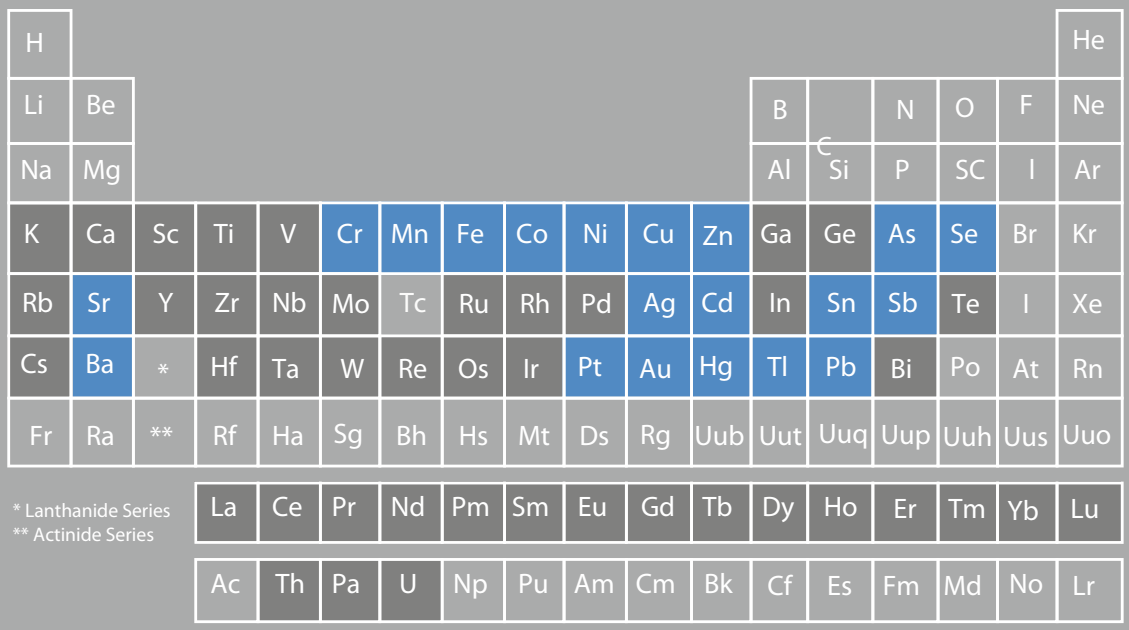
[1] Detection limits are determined using 95% confidence interference-free data.
[2] Power must be conditioned to maintain a factory warranty or service agreement.

Performance

Minimum Detection Limits (ng/m³)

Element	Atomic Number	Sampling Time (min) 15	30	60	120
Cr	24	0.14	0.05	0.018	0.006
Mn	25	0.14	0.05	0.018	0.006
Fe	26	0.38	0.13	0.048	0.017
Co	27	0.16	0.06	0.020	0.007
Ni	28	0.11	0.04	0.014	0.005
Cu	29	0.13	0.05	0.017	0.006
Zn	30	0.12	0.04	0.014	0.005
Ga	31	0.05	0.02	0.007	0.002
Ge	32	0.06	0.02	0.008	0.003
As	33	0.06	0.02	0.007	0.003
Se	34	0.07	0.02	0.009	0.003
Ag	47	2.17	0.77	0.271	0.096
Cd	48	2.88	1.02	0.360	0.127
In	49	3.39	1.20	0.424	0.150
Sn	50	3.74	1.32	0.467	0.165
Sb	51	0.33	0.12	0.042	0.015
Ba	56	0.47	0.17	0.059	0.021
Hg	80	0.09	0.03	0.012	0.004
Tl	81	0.09	0.03	0.012	0.004
Pb	82	0.11	0.04	0.014	0.005
Bi	83	0.12	0.04	0.015	0.005

Interference Free, 1 Sigma



Elements Supported

Xact® 640 monitoring system identifies and measures the 63 elements highlighted in the table below. Minimum detection limits (MDLs) for the elements highlighted in blue can be found on the Performance page of this data sheet. The system is capable of measuring the elements highlighted in dark gray, but MDLs have not been developed.

Ordering Information

To place an order or for more information about the Xact® 640 continuous emissions monitoring system, contact your regional CES representative or email us at info@cooperenvironmental.com

Cooper Environmental Services, LLC
9403 SW Nimbus Ave.
Beaverton, OR 97008
T: 503-670-8127 F: 503-624-2120
www.cooperenvironmental.com