

Gasmet™ in emissions monitoring – applications:

Stack testing according to USEPA methods

Stack testing

US EPA has two stack testing methods for FTIR (Fourier Transform Infrared) spectroscopy. Method 320 is an FTIR method for measuring wide range of organic and inorganic pollutants from stack. Method 321 is a specific version for measuring HCl at Portland cement plants. These methods define a QA/QC process to verify the accuracy of the results. The requirements for analytical equipment and software are defined on 40 CFR Part 60 Appendix B Performance Specification 15. Gasmet[™] analyzers and Calcmet[™] software have been designed to take the requirements of this performance specification into account.





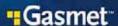


The Gasmet – solution:

The Portable Gasmet Measuring System has been designed with the most demanding stack testing applications in mind. It consists of Gasmet DX4000 – gas analyzer, Gasmet Portable Sampling Unit, Portable probe, heated sample gas lines and a laptop PC. All parts in contact with the sample are heated to 180 °C in order to avoid condensation.

ETA Process Instrumentation

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Typical analytical procedure to complete method 320 / 321 test

From paper by Maxwell Lee and John B. Koogler: Gas Emissions Testing By EPA Methods 320: Procedures And Results, Florida Section of the Air and Waste Management Association on Sept. 7-9, 2003

PRE-TEST

- 1) Background spectrum
 - Evaluate diagnostics of the instrumentation
- 2) Baseline (cylinder UHP-N₂) (i.e. zero check)
 - Determine the level of background noise
 - Observe spectrum for baseline tilt, i.e., indicates vibrations/perturbations affecting instrument
- 3) Calibration Transfer Standard (cylinder 100-ppm ethylene, i.e. span check)
 - Determine level of response to inert gas (e.g., C₄H₁₀) to evaluate the spectral response and stability of the instrument.
- 4) Direct analyte measure (e.g. cylinder 50-ppm HCl)
 - Create a field Reference Spectrum
- 5) Baseline
 - Note baseline flush/clean out FTIR sample cell
 - Observe spectrum for baseline tilt
- 6) Spectra of stack gas
 - Determine approximate stack gas analyte concentration
- 7) Optional 3 Spectra of QA-spike gas and makeup of UHP-N₂
 - Create field Reference Spectrum of analyte at approx. stack gas concentration
- Optional 3 Spectra of QA-spike gas and makeup of ambient air (typical moisture 1-2%)
 - Determine potential interference from low moisture
- 9) Baseline
- 10) 3 Spectra of QA-spike gas
 - Ensure acceptable analyte recovery

TEST - Run 1, 2, and 3 (repeat each run)

- 1) Baseline
- 2) 10 sequential spectra of stack gas (typical averaging time is 3 minutes)
- 3) Baseline
- 4) 3 Spectra of QA-spiked stack gas
 - must indicate ±30 percent expected recovery

POST-TEST

- 1) Baseline
- 2) Calibration Transfer Standard (i.e span check)
- 3) Direct analyte measure
- 4) Baseline

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