



Benzene Fenceline Monitoring - Method 325A/B

On September 29, 2015, the Environmental Protection Agency (EPA) issued the final Risk and Technology Review and New Performance Standards for refineries. The rule is based on two emissions standards already in place at refineries: the National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries (Refinery MACT 1 and MACT 2). The rule adds emission control requirements for storage tanks, flares and coking units and also requires the monitoring of air concentrations at the fenceline of refineries.

Methods 325A and 325B were included in the final rule. These methods provide details on how refineries are to deploy passive samplers at the fenceline of their facility to collect fugitive emission data for benzene.

TestAmerica Sacramento has been analyzing ambient air and source emission samples for more than 20 years. The laboratory uses Perkin Elmer Automated Thermal Desorption (ATD) gas chromatograph/mass spectrometer (GC/MS) equipment to achieve the detection limits required by Method 325B.

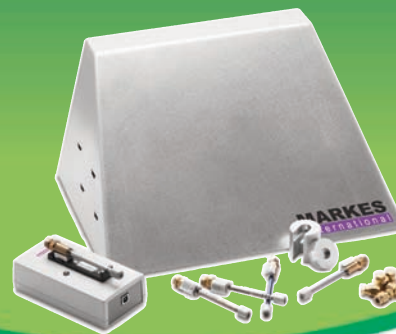
Passive diffusive sampling tubes are placed along the fenceline to measure the ambient air concentration at each sampling location over a 14 day period. The samplers consist of a small inert coated stainless steel tube filled with an adsorbent material. One end of the tube is capped with a mesh cover that allows the ambient air to diffuse on to the adsorbent material.

Benzene Concentration Action Level

U.S. EPA modeled fenceline benzene emissions from the 2011 refinery information collection request (ICR) to determine the benzene concentration action level. The EPA determined the limit to be 9 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) of benzene. This concentration reflects refinery sources only and excludes any background concentration. The collection of meteorological data will assist in determining if background sources are contributing to the benzene concentrations.

Compliance Timeline

Under the final rule, existing sources will be required to deploy samplers no later than 2 years after the effective date of the rule (January, 2018). Because the concentration action level is composed of 1 years' worth of data, the EPA is requiring that refineries demonstrate compliance with the concentration action level for the first time 1 year following the compliance date, and thereafter on a 1-year rolling annual average basis. The EPA is requiring that data be submitted electronically through its public electronic reporting portal and made publically available via the World Wide Web.



Sampling Points

The minimum number of samplers to be deployed will vary based on the size and shape of the refinery. For a small refinery (< 750 acres), 12 samplers would be placed at 30 degree intervals. For a medium-sized refinery (750 to 1,500 acres), 18 samplers would be deployed at 20 degree intervals and for a large refinery (> 1,500 acres), 24 samplers would be distributed at 15 degree intervals. Each sampling event also requires a minimum of 2 field blanks and 2 duplicates.

TestAmerica Approach

The rule requires that refineries monitor for benzene.

TestAmerica uses Carbopack X sorbent tubes, one of three sorbents specified in the method. Tubes are conditioned and blank checked for cleanliness prior to distribution to the field. Tubes must be used within 30 days of conditioning. Analysis is conducted using Perkin Elmer ATD GC/MS.

Quality Assurance

- Laboratory Blanks - Conditioned tubes must be demonstrated to be free of contaminants and interference by running 10 percent of the blank tubes.
- Field blanks - Minimum two per sampling event. Field blanks must be placed in two different quadrants (e.g., 90 ° and 270 °) and remain at the sampling location for the sampling period. One field blank tube is required for every 10 sampled tubes.
- Duplicate samples - Minimum two per sampling event. At least one co-located/duplicate sample must be collected for every 10 field samples to determine precision of the measurements.

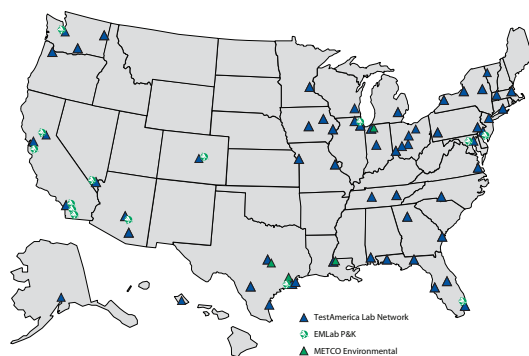
Shipping

- Document relevant information for each tube using a Chain of Custody form. Specify whether tubes are samples or field blanks.
- Place the sampled tubes, together with the field blanks, in the storage/shipping container. Do not use paints, markers, or adhesive labels to identify the tubes.
- Sampled tubes may be shipped at ambient temperature.

Sampling

- Use a protective hood or shelter to protect the passive sampler from rain and excessive wind velocity.
- Allow tubes to equilibrate for 30 to 60 minutes before deploying.
- Remove the storage cap on the sampling end of the tube and replace it with a diffusive sampling cap at the start of the sampling period. Store the removed storage caps in the empty tube container.
- Record the start time and location details for each sampler on the field sample data sheet.
- Expose the sampling tubes for the 14-day sampling period. After the sampling period is complete, immediately replace the diffusion end cap on each sampled tube with a long-term storage end cap. Tighten the seal securely by hand and then tighten an additional quarter turn. Record the stop date and time and any additional relevant information such as the meteorological measurements.
- Collect daily unit vector wind direction data plus average temperature and barometric pressure. You must supply this to the lab.

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