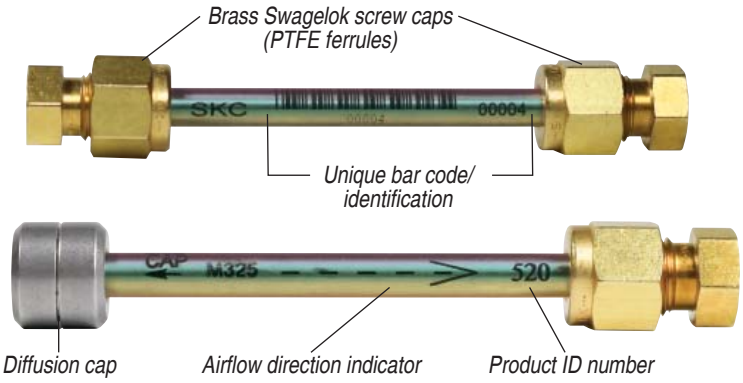
EPA 325 Passive TD Tubes for Benzene

Continuous Monitoring at Refinery Fenceline Locations

- **Meet specifications of U.S. EPA 325A**
  - 3.5 x 0.25-inch OD stainless steel tube deactivated with SilcoNert® 2000
  - Pre-conditioned Carbopack® X sorbent held between two 100-mesh stainless steel screens
  - Sealed with brass Swagelok® screw caps with PTFE ferrules for transport
  - Diffusion cap
  - Unique identification number and bar code
  - Airflow direction and cap placement arrow indicators printed on tube
- **Benzene uptake rate of 0.67 ml/min on Carbopack X sorbent**
- **Use to determine average benzene concentration in the range of 0.5 to 500 µg/m³ over a two-week period**
- **Analyze collected compounds quantitatively using GC or GC-MS**
- **Reusable after laboratory conditioning**
- **Establish baseline/manage exceedances for benzene**
  - Ideal for establishing average airborne concentrations of additional VOCs of concern
- **Allow for extended sample times for low-level measurements**

SKC EPA 325 Passive Thermal Desorption (TD) Tubes for Benzene meet specifications in U.S. EPA Method 325A (written into Petroleum Refinery Sector Risk and Technology Review and New Source Performance Standards - 40 CFR Parts 60 and 63). This rule requires refineries to perform continuous benzene monitoring using a specific type of passive thermal desorption tube at several fenceline locations. Monitoring is to be performed continuously in 14-day increments and samples analyzed by GC/MS as described in EPA 325B. A rolling annual average of the background-adjusted benzene concentration must be at or below the compliance standard of 9 µg/m³. **SKC EPA 325 Passive TD Tubes are your media solution for refinery fenceline monitoring to comply with the final rule.**



SKC

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EPA Method 325

EPA 325A requires refineries to deploy 12 to 24 passive samplers every two weeks to monitor benzene‡ concentration around the fenceline of each refinery. The total number of samplers to be deployed is based on refinery size. Benzene concentration on the samplers is monitored on an annual rolling average to determine the presence of significant excess fugitive emissions. Major source petroleum refineries in the U.S. have two years after promulgation of the rule to implement a sampling protocol. SKC EPA 325 Passive TD Tubes can be used initially to establish a baseline to help manage exceedances and then for compliance sampling once mandatory.

‡ *While the rule establishes protocol for monitoring benzene, EPA 325 can be used to screen average airborne concentrations of additional VOCs of concern (including other HAPs) at ambient monitoring sites. See page 3 of this document.*

About SilcoNert 2000 (Siltek®/Sulfinert®)

SilcoNert 2000 is used as a coating to deactivate the stainless steel EPA 325 Passive TD Tubes for Benzene. This process improves corrosion resistance, inertness, and hydrophobicity for better detection limits and system performance.

SKC Quality Control

SKC high-quality sorbents are purged and analyzed for background of VOCs prior to being packed into tubes.

SKC Passive Thermal Desorption Tube Applications

- Fenceline monitoring
- Indoor air sampling
- Vapor intrusion studies

References

McClenny, W.A. et al., "24 h Diffusive Sampling of Toxic VOCs in Air onto Carbopack X Solid Adsorbent Followed by Thermal Desorption/GC/MS Analysis–Laboratory Studies," J. Environ. Monit., Vol. 7, Issue 3, 2005, pp. 248-256

Technical Note: Sampling Rates for Benzene and Other VOCs Using the SKC Diffusive TD Tube, www.skcinc.com/catalog/pdf/instructions/1920.pdf

Federal Register, Vol. 80, No. 230, 40 CFR Parts 60 and 63, www.gpo.gov/fdsys/pkg/FR-2015-12-01/pdf/2015-26486.pdf

EPA Method 325A, Volatile Organic Compounds from Fugitive and Area Sources, (sampling), https://www.epa.gov/emc

EPA Method 325B, Volatile Organic Compounds from Fugitive and Area Sources, (analysis), https://www.epa.gov/emc

Performance Profile

Sorbent: (*see References for Validation*) Carbopack X; Anasorb GCB1*

Tube Material: Stainless steel coated with SilcoNert 2000, sealed with brass Swagelok screw caps fitted with PTFE ferrules

Uptake Rate: Benzene: 0.67 ml/min (Carbopack X); 0.63 ml/min (Anasorb GCB1)
(See page 3 for validated uptake rates for other VOCs)

Dimensions: 3.5 x 0.25-in OD

Analysis: GC or GC-MS (EPA 325B)

Note: *All tubes are conditioned and quality control tested to assure low background.*

Ordering Information

Description	Cat. No.	Qty.
SKC EPA 325 Passive TD Tubes for Benzene,† 3.5 x 0.25-inch OD deactivated stainless steel tubes filled with pre-conditioned sorbent and supplied with diffusion caps and brass Swagelok screw caps with PTFE ferrules		
Carbopack X	**226-520**	**10**
Anasorb GCB1*	**226-521**	**10**
Diffusion caps	**226-525**	**10**
Shelter, 4-inch diameter x 5.5-inch length	**226-526**	**ea**

† *Tubes must be used within 30 days of conditioning.*

* *Equivalent to Carbopack B/Carbograph1*

Shelter protects tubes from rain and debris.

SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to http://www.skcinc.com/warranty.

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Validated Uptake Rates (ml/min) and Sorbents for Selected Clean Air Act Compounds

Compound	Carbopack X (Tube Cat. No. 226-520)	Anasorb GCB1* (Tube Cat. No. 226-521)
Benzene	0.67 ± 0.06	0.63 ± 0.07
Carbon tetrachloride	0.51 ± 0.06	N/A
Chlorobenzene	0.51 ± 0.06	N/A
3-Chloropropene	0.51 ± 0.3	N/A
p-Dichlorobenzene	0.45 ± 0.05	N/A
1,1-Dichloroethane	0.57 ± 0.1	N/A
1,2-Dichloroethane	0.57 ± 0.08	N/A
1,1-Dichloroethene	0.57 ± 0.14	N/A
1,2-Dichloropropane	0.52 ± 0.1	N/A
Ethylbenzene	0.46 ± 0.07	0.50
Styrene	0.50 ± 0.14	N/A
Tetrachloroethene	0.48 ± 0.05	N/A
Toluene	0.52 ± 0.14	0.56 ± 0.06
1,1,1-Trichloroethane	0.51 ± 0.1	N/A
1,1,2-Trichloroethane	0.49 ± 0.13	N/A
Trichloroethene	0.50 ± 0.05	N/A
m,p-Xylene	0.46 ± 0.09	0.47 ± 0.04
o-Xylene	0.46 ± 0.12	0.47 ± 0.04

** SKC Anasorb GCB1 is equivalent to Carbopack B/Carbograph 1.*

Reference: *EPA Method 325B—Volatile Organic Compounds from Fugitive and Area Sources, Table 12.1, https://www3.epa.gov/ttnemc01/promgate/m-325b.pdf*