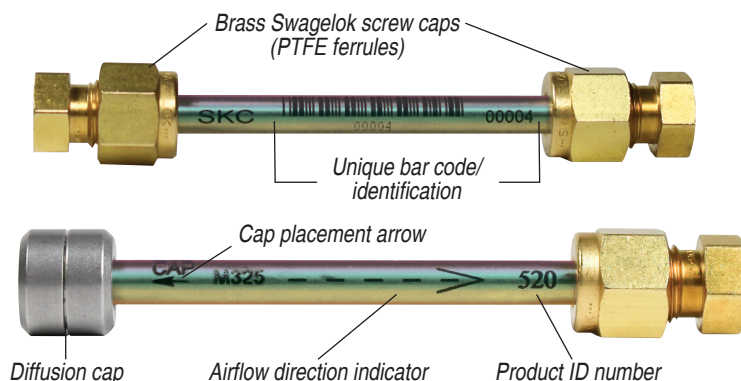


# EPA 325 Passive TD Tubes for Benzene

Continuous Monitoring at Refinery Fenceline Locations

- EPA-validated sampling rates available for benzene, toluene, ethylbenzene, xylenes, and many other VOCs
- May be used to sample SVOCs
- Contain pre-conditioned sorbent to meet EPA 325 requirements
  - Lower cost option available with Anasorb GCB1 sorbent
- SilcoNert® 2000 deactivated 3.5-inch length x 0.25-inch OD stainless steel tubes for sample integrity
- Allow for extended sample times for low-level measurements
- Reusable after laboratory conditioning
- Unique identification number and bar code
- Weatherproof tube shelter available
- Airflow direction and cap placement arrow indicators printed on tube
- Sealed with brass Swagelok screw caps with PTFE ferrules for transport
- Collected compounds are analyzed quantitatively using GC or GC-MS

SKC Passive Thermal Desorption (TD) Tubes offer users an easy, accurate way to sample low-level VOCs and SVOCs over extended periods of time. These passive samplers meet requirements of the EPA 325 regulation for fenceline monitoring of benzene at petroleum refineries with extended sample periods of 14 days. SKC supplies sampling rates for other VOCs to expand the use of these passive devices for other applications. A weatherproof shelter is available for protecting samplers during outdoor sampling.



### EPA Method 325

EPA 325A requires refineries to deploy 12 to 24 passive samplers every two weeks to monitor benzene<sup>‡</sup> 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.

<sup>‡</sup> 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, <https://www.skcinc.com/media/documents/voc-benzene-passive-tubes-tech-note-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](http://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:** Carbopack X  
(see References for Validation) 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, <sup>†</sup> 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

<sup>†</sup> Tubes must be used within 30 days of conditioning.

\* Equivalent to Carbopack B/Carbograph1



Shelter protects tubes from rain and debris.

## EPA 325 Passive TD Tubes for Benzene

## Continuous Monitoring at Refinery Fenceline Locations

## 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://www.epa.gov/emc/emc-promulgated-test-methods>