

AIR MONITORING WITH CHLOROSORBER™

THE PREFERRED PASSIVE SORBENT SAMPLER TO TARGET CHLORINATED COMPOUNDS



BENEFITS

- Time-weighted average concentrations
- Sample for hours, days, or weeks
- Reliably target chlorinated compounds, including Vinyl Chloride.
- Air quality monitoring during remediation
- More accurate than other other passive methods
- Sensitive – Detection limits in the ppt range
- Easy-to-use BeSure Sample Collection Kit™

APPLICATIONS



Sewer Gas
Sampling



Vapor Intrusion
Monitoring

Preferred Method

With the ChloroSorber™ Sampler, Beacon can target chlorinated compounds with high-level precision and accuracy in indoor and ambient air following established U.S. EPA, ASTM and ISO methods, as well as other international protocols. The sorbent used is ideal for targeting PCE and its degradation products, including Vinyl Chloride, at trace levels.

Beacon's quantitative ChloroSorber samplers are inexpensive to ship and are also provided at an overall lower price as compared to canister samples. Their ease of transport, simple installation procedures and ability to report time-weighted average concentration data ($\mu\text{g}/\text{m}^3$) at trace levels with third-party validated uptake rates make them the preferred sampling method for chlorinated compounds.

The ChloroSorber Sampler has a 30-day hold time and is analyzed at Beacon's accredited laboratory.

CHLOROSORBER™ PASSIVE SAMPLER



Beacon provides several passive sorbent samplers, for commercial and residential applications, to accurately and reliably target petroleum and chlorinated compounds in the indoor and ambient air. Beacon analyzes sorbent samplers with various adsorbents depending on which compounds are of concern. However, the performance of a sorbent tube with a select adsorbent preferred by Beacon was evaluated in a robust study completed by the Health and Safety Executive (HSE) in the United Kingdom and the validated uptake rates from that study are used to accurately target a range of chlorinated compounds from vinyl chloride to tetrachloroethene (PCE) with low-level detection limits.

Other passive samplers are known to use inexpensive and inferior adsorbents that are not appropriate for vinyl chloride and possibly other volatile compounds, resulting in false negatives and at a minimum biased low results.¹ The ChloroSorber provided by Beacon overcomes these challenges and concerns.

Sampler Uptake Rates and Reporting Limits

Quantitative uptake rates for eight key chlorinated VOCs were determined and verified



for the ChloroSorber. In the six-replicate study conducted at HSE, the ChloroSorber showed excellent performance with great linearity and reproducibility. The ChloroSorber is analyzed following U.S. EPA Method TO-17 (TD-GC/MS) to provide time-weighted average concentrations (ug/m³) that are legally defensible and more accurately measure the exposure risks than short duration samples collected over only minutes or hours.

The equation used to calculate the time-weighted average concentrations is provided below.

$$C = \frac{1000 \times M}{U \times t}$$

- Where: C = concentration (ug/m³)
 M = mass (ng)
 U = uptake rate (ml/min)
 t = sampling time (minutes)

Beacon, which is known globally for being the most experienced laboratory for thermal desorption analyses, is able to achieve lower reporting limits than other laboratories. The limits of detection (LODs) for the ChloroSorber, based on sampling periods from days to weeks, are shown below.

Limits of Detection (LODs) based on Exposure Periods and Third-Party Validated Uptake Rates

COMPOUND	CAS	Uptake Rate (ml/min)	3 Days	7 Days	10 Days	14 Days	26 Days
			LOD (ug/m ³)	LOD (ug/m ³)	LOD (ug/m ³)	LOD (ug/m ³)	LOD (ug/m ³)
Vinyl Chloride	75-01-4	0.56	0.21	0.09	0.06	0.04	0.02
1,1-Dichloroethene	75-35-4	0.45	0.26	0.11	0.08	0.06	0.03
trans-1,2-Dichloroethene	156-60-5	0.70	0.17	0.07	0.05	0.04	0.02
1,1-Dichloroethane	75-34-3	0.74	0.16	0.07	0.05	0.03	0.02
cis-1,2-Dichloroethene	156-59-2	0.70	0.17	0.07	0.05	0.04	0.02
1,2-Dichloroethane	107-06-2	0.44	0.26	0.11	0.08	0.06	0.03
Trichloroethene	79-01-6	0.65	0.18	0.08	0.05	0.04	0.02
Tetrachloroethene	127-18-4	0.55	0.21	0.09	0.06	0.05	0.02

¹Karstoft, J., Mortensen, P. *Measurement for Vinyl Chloride in Indoor Climate*. NIRAS/Region Midtjylland, Denmark. November 13, 2018.