Operating Instructions

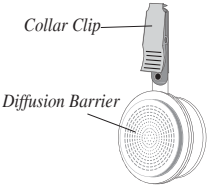
863 Valley View Road, Eighty Four, PA 15330 USA
Tel: 724-941-9701 Fax: 724-941-1369 e-mail: skctech@skcinc.com

Ultra I Passive Samplers

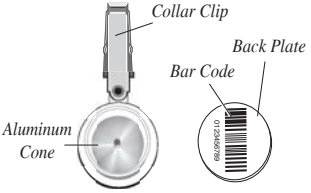
Introduction

SKC Ultra I Passive (diffusive) Samplers are small badges prefilled with cleaned/purged sorbent for the reliable sampling and highly sensitive detection of low ppb-level volatile organic compounds (VOCs) using thermal desorption for analysis.

Cover lock and Cover



Front View



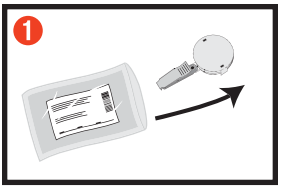
Back View

Specifications for Ultra I

Sorbent:	Tenax® TA, Chromosorb® 106, Anasorb® GCB1, or Carbopack X
Diameter:	1.4 in (3.5 cm)
Length (including clip):	2.5 in (6.3 cm)
Depth:	0.6 in (1.5 cm)
Analysis:	Thermal desorption; gas chromatography (GC)
Shelf-life:	30 days from date of manufacture. Storage at < 39.2 F (4 C) is recommended.
Sampling Rates:	Go to www.skcinc.com, click on "Sampling Guides," and select "Passive (Diffusive) Sampling Guide."

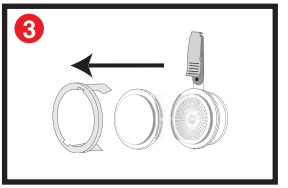
Sampling

1. Open aluminized resealable pouch and remove sampler.



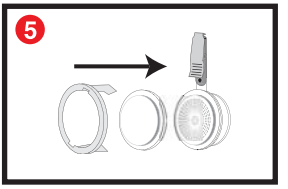
2. Write start time and date on label on the resealable pouch. The barcode on the sampler matches the barcode on the pouch label.

3. Remove cover lock and cover from face of sampler (i.e., side containing diffusion holes). **Do NOT remove back plate that covers aluminum cone.** Place cover lock and cover in resealable pouch for use at end of sampling.

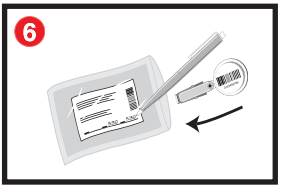


4. Clip sampler to a worker's collar near the breathing zone. The small diffusion holes must face outward.

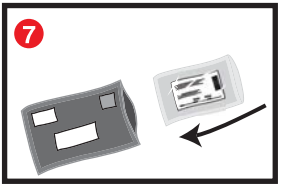
5. After desired sampling period, unclip sampler from worker's collar and seal sampler with cover and cover lock.



6. Write stop time on label on the pouch. **Ensure barcode on the sampler matches the barcode on the pouch label.** Place sealed sampler into the resealable pouch.



7. Carefully package sampler and send to a laboratory for analysis.



Factors for Determining Application and Storage

Prior to purchasing Ultra I Samplers, evaluate specific compounds of interest and expected levels. Factors that should be considered include:

- **The sampler housing:** Small quantities of VOCs may off-gas from the housing over time, which may be a problem for ppt-level applications.
- **The sorbent:** Polymeric sorbents such as Tenax TA can increase in background during storage.

Remedies may include:

- Storing in refrigerator to **reduce** off-gassing
- Transferring sorbent from the badge to a thermal desorption tube, purging the sorbent, and reloading it into the badge prior to use
- Selecting the Ultra II Passive Sampler, which is filled by the user with purged sorbent just prior to sampling. Sorbent is provided in glass vials with PTFE-lined caps.

Storage

Before Sampling: Up to 30 days at < 39.2 F (4 C) in a clean, organic solvent-free environment

After Sampling: 21 days at < 39.2 F (4 C) in a clean, organic solvent-free environment

Analysis

1. Remove sampler from resealable pouch and lay flat with capped aluminum cone facing upward.
2. Slowly remove back plate. Rotate plate a couple of revolutions to help loosen seal before attempting to remove it.

> **Caution:** Avoid popping off back plate and keep sampler level to prevent sorbent spillage.

3. Place a thermal desorption tube* over the opening of the cone. Ensure that the end of the tube facing upward contains a stainless steel screen and glass wool separator to hold sorbent in place.
4. Transfer sampler sorbent to tube by tipping sampler upside down while holding tube in place. Gently tap cone to remove any remaining sorbent.
5. Remove sampler from tube and place a stainless steel screen and glass wool separator in the other end of the tube.
6. Seal tube with PTFE caps or Swagelok® fittings. The tube is ready for thermal desorption.
7. Analyze using a gas chromatograph (GC) with the detector specified in the method for the compound of interest.

* *Thermal desorption tubes must be 0.25-inch O.D., 0.194-inch I.D., and a minimum length of 3.5 inches (Perkin Elmer Thermal Desorber). Thermal desorption tube blanks that meet these specifications are available from SKC (Cat. No. P226350).*

Validation

Ultra I Passive Samplers were evaluated by the U.S. Military[1, 2], OSHA Technical Center (Salt Lake)[3], Swedish researchers[4], and SKC R&D Laboratories[5, 6]. Samplers with specific sorbents were found to be suitable for 8-hour workshift sampling, 24-hour indoor air studies targeting medium-to-high boiling point compounds, and for 24-hour or 7-day sampling of benzene and 1,3-butadiene†.

† Uptake rates for 1,3-butadiene were found to decline over a one-week period

References

1. *Hendricks, W.D., et. al., Feasibility of Diffusive Sampling to Monitor U.S. Military Personnel for Exposure to Toxic Chemical Substances, U.S. Dept. of Labor, OSHA, SLTC, Salt Lake City, UT, 2002*
2. *Hendricks, W., The Marines Project: A Laboratory Study of Diffusive Sampling/Thermal Desorption/Mass Spectrometry Techniques for Monitoring Personal Exposure to Toxic Industrial Chemicals, Industrial Hygiene Division, OSHA, SLTC, Salt Lake City, UT, Apr. 2002*
3. *Hendricks, W., Performance of SKC Ultra Passive Samplers Containing Carboxen 1016, Carbotrap Z, or Chromosorb 106 When Challenged With a Mixture Containing Twenty of OSHA SLTC's Top Solvent Analytes, Methods Development Team, Industrial Hygiene Chemistry Division, OSHA, SLTC, Salt Lake City, UT, Feb. 2003, www.osha.gov, search on "Ultra"*
4. *Strandberg, B., et. al., "Evaluation of Two Types of Diffusive Samplers and Adsorbents for Measuring 1,3-butadiene and Benzene in Air," Atm. Environ., Vol. 39, July 2005, pp. 4104-4110*
5. *Coyne, L., et. al., Using Diffusive Samplers for Monitoring for Ppb Levels of Volatile Organic Compounds in Indoor Air, presented at AirMon 02, Lillehammer, Norway, Feb. 2002*
6. *Coyne, L., et. al., Using Diffusive Samplers for Monitoring for Ppb Levels of Volatile Organic Compounds in Air, presented at AIHce 2002, San Diego, CA, June 2002*

Ordering

Ultra I Passive Samplers	Cat. No.	Qty.
Tenax TA, 265 mg	**590-100***	**5**
Chromosorb 106, 285 mg	**590-200*∞**	**5**
Anasorb GCB1‡, 370 mg	**590-102***	**5**
Carbopack X, 500 mg	**590-103***	**5**

** Use within 30 days; storage at < 39.2 F (4 C) recommended*

‡ Comparable to Carbopack B

∞ See Reference 3 for additional information on sampling rates for Chromosorb 106.

Analysis Accessory		
Thermal Desorption Tube, Perkin Elmer, 0.25 x 3.5 inch, includes screens and end caps	**P226530**	**ea**

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.asp.