



# Sample Setup Guide

## Sampling with UME<sup>x</sup> Passive (Diffusive) Samplers



Passive sampling is the collection of airborne gases and vapors at a rate controlled by a physical process such as diffusion, **without** the use of an air sampling pump. Passive (diffusive) samplers rely on the movement of contaminant molecules across a concentration gradient (i.e., molecules diffuse from an area of high concentration in air to an area of low concentration onto the sampler). This rate of diffusion can be calculated mathematically and determined experimentally for individual chemicals. SKC provides diffusion or sampling rates for sampling formaldehyde, ammonia, sulfur dioxide, and nitrogen dioxide with UME<sup>x</sup> Passive Samplers. This Sample Setup Guide demonstrates the basic operation of an SKC UME<sup>x</sup> Passive Sampler and defines the critical sampling information that should be sent to a laboratory for analysis.

### Introduction

#### UME<sup>x</sup> 100 for Formaldehyde\*

SKC UME<sup>x</sup> 100 Passive Samplers (Cat. No. 500-100) provide low ppb-level sampling of formaldehyde onto a DNPH-treated tape. The sampler contains both a section of tape that collects the sample and a section that can be used as a blank/correction. UME<sup>x</sup> 100 samplers meet the specifications of OSHA Method 1007, conform to EU ISO 16000-4-2004, and comply with MDHS 78.

#### UME<sup>x</sup> 200 for Sulfur Dioxide and/or Nitrogen Dioxide

UME<sup>x</sup> 200 Passive Samplers (Cat. No. 500-200) provide ppm-level sampling of sulfur dioxide and/or nitrogen dioxide. The sample collects onto a tape treated with triethanolamine (TEA). The sampler contains both a section of tape that collects the sample and a section that can be used as a blank/correction.

#### UME<sup>x</sup> 300 for Ammonia

UME<sup>x</sup> 300 Passive Samplers (Cat. No. 500-300) provide ppm-level sampling of ammonia. The sample collects onto a tape treated with sulfuric acid. The sampler contains both a section of tape that collects the sample and a section that can be used as a blank/correction.

See the SKC Passive Sampling Guide on the SKC website [www.skcin.com](http://www.skcin.com) for UME<sup>x</sup> sampling rates and minimum and maximum sampling times.

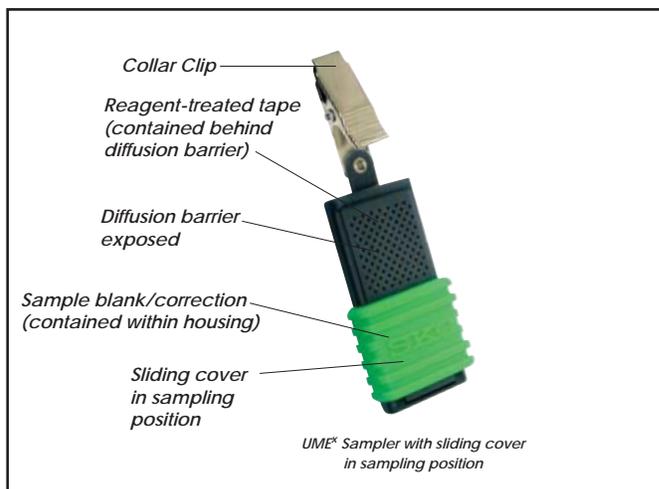
\* If sampling in an atmosphere containing formalin, see [www.skcin.com/instructions/1795.pdf](http://www.skcin.com/instructions/1795.pdf) for field study information.

### 1. Sample Collection

Remove the sampler from the resealable pouch. Set pouch aside to send the sampler to the laboratory. *Store pouch away from potential formaldehyde, ammonia, sulfur dioxide, or nitrogen dioxide sources.*

Write the sample start time, date, location, and a user-assigned sampler identification number on the label on the back of the sampler.

Clip the sampler onto a worker's collar for personal sampling or in an appropriate location for area sampling. Slide the sampler cover to the "on" position (expose diffusion holes) to begin sampling.



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After sampling, slide the sampler cover to the "off" position (cover diffusion holes) to stop sampling. Unclip the sampler and record the sample stop time on the label on the back of the sampler. Place the sampler into the resealable pouch immediately after sampling. Seal the pouch.

## 2. Sampler Storage and Shipment to Analytical Laboratory

Carefully package sealed pouches containing samplers. Each UME<sup>x</sup> sampler contains a section of tape that can be used as a blank/correction.

- **Formaldehyde Samples on UME<sup>x</sup> 100:** Ship the samplers to the laboratory using **expedited shipping**. Samples should be kept at  $\leq 39.2$  F (4 C) and should be analyzed within 3 weeks. Do not store with food.
- **Sulfur Dioxide/Nitrogen Dioxide Samples on UME<sup>x</sup> 200:** Ship the samplers to the laboratory. Samples can be stored at ambient temperature or at  $\leq 39.2$  F (4 C) and should be analyzed within 3 weeks. Do not store with food.
- **Ammonia Samples on UME<sup>x</sup> 300:** Ship the samplers to the laboratory. Samples may be stored at freezer [ $\leq 39.2$  (4 C)] or ambient temperatures and should be analyzed within 3 weeks. Do not store with food.

**Note:** SKC UME<sup>x</sup> passive samplers are designed for single use only. Do **NOT** reuse UME<sup>x</sup> samplers.

## 3. Critical Information to Include in Sample Shipment

The laboratory will need to know the air volume for the chemical of interest. Calculate as follows:

$$\text{Chemical sampling rate supplied by SKC (ml/min)} \times \text{Sampling time (min)} = \text{Air volume (ml or L)}$$

The laboratory will determine the total micrograms ( $\mu\text{g}$ ) found on the sampler for the chemical of interest. The air volume will be used to report the chemical concentration in air as parts per million (ppm) or parts per billion (ppb).

## 4. Analysis

- **Formaldehyde Samples on UME<sup>x</sup> 100:** Desorption of hydrazone and analysis by high-performance liquid chromatography (HPLC) with UV detection.
- **Sulfur Dioxide/Nitrogen Dioxide Samples on UME<sup>x</sup> 200:** Solvent extraction and ion chromatography with conductivity detection
- **Ammonia Samples on UME<sup>x</sup> 300:** Solvent extraction and ion chromatography with conductivity detection

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