



## Operating Instructions

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### UMEX<sup>300</sup> Passive Sampler for Ammonia Cat. No. 500-300

The SKC UME<sup>x</sup> 300 Passive Sampler effectively collects ammonia at 39.92 ml/min. The UME<sup>x</sup> 300 Passive Sampler contains a tape treated with sulfuric acid. Each sampler incorporates a "blank/correction" section of tape in addition to the sample section of tape. Analysis is by ion chromatography (IC) with conductivity detection or visible absorption spectrometry for identification of ammonia that may be present in the sample. Designed for single use, the SKC UME<sup>x</sup> 300 Passive Sampler is packaged in an aluminized pouch for easy sample transport to a laboratory.



#### Performance Profile

**Sampling Rate:** 39.92 ml/min with a relative standard deviation of 11.4%

#### Validated

**Concentration Range:** 0.1 to 100 ppm

**Analysis Method:** Solvent extraction and analysis of ammonium ion by IC with conductivity detection or visible absorption spectrometry

**Lower Detection Limits:**  
15 min: 2.4 ppm  
8 hrs: 0.075 ppm  
24 hrs: 0.025 ppm

**Shelf-life:** Limited; check expiration date on packaging.

**Storage:** *Before use:* ≤ 39.2 F (4 C)  
*After use:* Ambient temperature (72 F [22 C]) or ≤ 39.2 F (4 C) and analyze within 3 weeks

**Accuracy:** ± 23.4%

**Temperature Effects:** No effect on sampling rate from 22 to 40 C

**Humidity Effects:** No effect from 20 to 80% relative humidity (RH)

**Wind Velocity Effects:** No effect from 5 to 100 cm/sec

**Interferences:** None identified

**Dimensions:** 3.4 x 1.1 x 0.35 in (8.6 x 2.8 x 0.89 cm)

**Weight:** 0.38 oz (10.9 gm)

**Slide Cover:** Pink

## Sampling Instructions

- Cautions:**
- Do not store with food.
  - Before sampling, check the expiration date on the label on the outside of the pouch. Do not use after the last day of the month indicated.
  - SKC recommends using gloves when handling chemically treated media.
  - UME<sup>x</sup> samplers are designed for single use only. Do NOT reuse UME<sup>x</sup> samplers.

1. Open the aluminized pouch and remove the sampler. Do not discard the pouch; use it to send sampler to the laboratory. **Store the pouch away from potential ammonia sources.**
2. Enter date, start time, and location in the space provided on the back of the sampler.
3. Position the sampler on a worker's collar for personal sampling or in an appropriate location for area sampling.
4. Slide the sampler cover to the "on" position to begin sampling.
5. After sampling for the desired time, up to 24 hours, slide the sampler cover to the "off" position to stop sampling. Enter the sample stop time in the space provided on the back of the sampler.
6. Place the sampler in the original pouch immediately after sampling.
7. Seal the pouch. Send pertinent information and sample to an accredited laboratory for analysis.

## Analysis Instructions for Ammonia

### Calibration Standards – Ammonium

Purchase commercially available ammonium standards appropriate for your application. Prepare a range of ammonium standards in de-ionized ultra-filtered (DIUF) water as outlined in *Sample Preparation*.

**Note:** *The ammonium curve is not linear. A graphing program will be needed to calculate results.*

### Sample Preparation for Ammonia

1. Remove the sampler from the pouch and the sliding cover from the sampler.
2. Use clean forceps to lift out the treated tape from each section. Place each piece of tape in a sealed vial. This provides a sample and a blank/correction.

**Note:** *It is also acceptable to use a "lot" blank to correct for background. One lot blank is included in each box of badges.*

**Note:** *The blank/correction section of tape has an indentation for easy identification.*

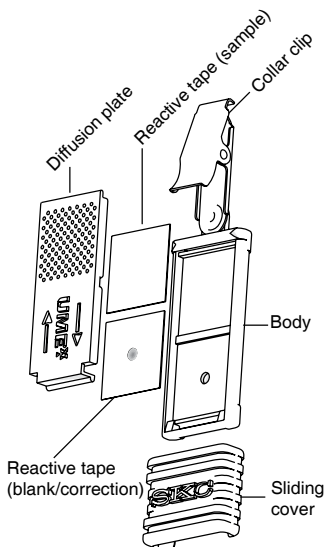
3. Ammonium is desorbed from both the sample and the blank/correction tapes by adding 3 ml of DIUF water to each vial. Shake the sample by hand and then let stand for 60 minutes. Excessive shaking causes the filter to break apart in the vial.
4. Immediately transfer 1 ml of extract to an auto-sampler vial for analysis of ammonia.

## Ammonia Sample Analysis

1. The sample extracts are analyzed for the ammonium ion by ion chromatography with conductivity detection or visible absorption spectrometry.
2. A 25-microliter portion of the extract is injected onto a Dionex 3 x 250-mm CS16 column and with a 36-mM methanesulfonic acid eluent.
3. Calculate the ammonium results by comparing against a standard calibration curve.
4. Convert the results from ammonium to ammonia using the following formula:  
Concentration  $\mu\text{g/ml}$  ammonia = Concentration  $\mu\text{g/ml}$  ammonium  $\times 0.944$
5. Total mass of ammonia is calculated below:  
Concentration ammonia ( $\mu\text{g/ml}$ )  $\times$  Desorption volume (3 ml)
6. The ammonia from the blank/correction tape must always be subtracted from the sample tape when calculating air concentrations.
7. Calculate the air concentration in ppm using the following equations:

$$\text{Volume of air (liters)} = \frac{\text{Time (minutes)} \times \text{Sampling rate (39.92 ml/min)}}{1000}$$

$$\text{Concentration (ppm)} = \frac{\text{Mass (mg)} \times 24450}{\text{Air volume (L)} \times \text{Molecular weight (17.0 gm/mole)}}$$



<b>UME<sup>x</sup> Passive Samplers<sup>*,#</sup></b>	<b>Cat. No.</b>
<b>UME<sup>x</sup> 300,<sup>‡</sup></b> for ammonia, pk/10	<b>500-300</b>
<b>UME<sup>x</sup> 100,<sup>‡</sup></b> for formaldehyde and other aldehydes, pk/10	<b>500-100</b>
<b>UME<sup>x</sup> 200,</b> for sulfur dioxide and/or nitrogen dioxide, pk/10	<b>500-200</b>
<b>UME<sup>x</sup> 400,<sup>‡</sup></b> for aliphatic amines, pk/10	<b>500-400</b>
<b>Accessory</b>	
<b>Treated Tape,</b> for QC purposes only, pk/25	<b>P20083</b>
<b>Stand for Area Sampling</b>	<b>690-302</b>

\* Limited shelf-life. Do not store with food.

‡ Storage at  $\leq 39.2^{\circ}\text{F}$  ( $4^{\circ}\text{C}$ ) required

# UME<sup>x</sup> passive samplers are designed for single use only. Do NOT reuse UME<sup>x</sup> samplers.

## SKC Limited Warranty and Return Policy

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