ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

SKC UMEx 300 Passive Sampler for Ammonia

Storing, wearing and returning the single-use SKC UMEx 300 passive sampler for ammonia, Cat. No. 500-300, with the sample preparation, analysis and calculation for the laboratory.

AMTC-IN-0055

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About this document

These instructions cover the SKC UMEx 300 Passive Sampler for Ammonia, Cat. No. 500-300. It tells you how to store the samplers, how to take a personal or area sample and how to return it to the laboratory. A chapter for the laboratory gives the sample preparation, the analysis and the calculation of the airborne concentration.

Read Safety (p. 4) and Product and supplied items (p. 5) first. Then follow Before use (p. 6), Procedure (p. 7) and After use and sample handling (p. 8) step by step. Pass Analysis (p. 8) on to your laboratory with the samples.

Keep these instructions for the lifetime of the product. The current revision is on the product page at analyt-mtc.com.

How these instructions mark information

⚠ CAUTION

A hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

Practices not related to personal injury — damage to the product, the process or the sample.

Note
Information that helps understanding; never a hazard.

Document information

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Rev.	Date	Change
2	October 2026	Quality programme: new document type, number and identity pages.
1	October 2026	First issue.

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CHAPTER 1

Safety

Read this chapter before you use the sampler. Wear gloves whenever you handle the sampler or its tapes, in the field and in the laboratory.

Intended use

The SKC UMEx 300 samples ammonia in workplace air without a pump, as a personal sample on a worker's collar or as an area sample. It is validated from 0.1 to 100 ppm, for sampling times of up to 24 hours.

Handling the sampler

⚠ CAUTION

Treated media. The tapes are treated with sulphuric acid. Wear gloves when you handle the sampler, and do not store samplers with food.

NOTICE

Check the expiration date. It is on the label on the outside of the pouch. An expired sampler can give an invalid result. Do not use the sampler after the last day of the month shown.

NOTICE

Single use only. Do not reuse UMEx samplers. A reused sampler may not collect the sample reliably, so the result is then invalid.

In the laboratory

NOTICE

Excessive shaking breaks the tape apart in the vial. Do not shake the vial too hard.

CHAPTER 2

Product and supplied items

The SKC UMEx 300 is a small badge that samples ammonia in workplace air without a pump. Clip it to a worker's collar for a personal sample, or place it in the room for an area sample.

Ammonia diffuses through the holes of the diffusion plate at 39.92 mL/min and is collected on a tape treated with sulphuric acid. Each sampler also holds a second section of the same tape, the blank/correction, which travels to the laboratory with the sample and is analysed alongside it. A pink sliding cover switches sampling on and off. The laboratory extracts both tapes with water and determines the ammonium ion by ion chromatography with conductivity detection, or by visible absorption spectrometry.

Each sampler comes in an aluminised pouch, which also serves to send it to the laboratory after sampling. The sampler is for single use only.

Parts of the sampler

The diffusion plate (1) closes the body (4) over the two tapes. The upper tape (2), under the holes of the plate, takes the sample. The lower tape (3) is the blank/correction; it carries an indentation so that the laboratory can tell the two apart.

The sliding cover (6) fits over the body. Slide it to the "on" position to start sampling and back to "off" to stop. The collar clip (5) holds the sampler on clothing or at the sampling location.



Figure 2-1. The UMEx 300 sampler.

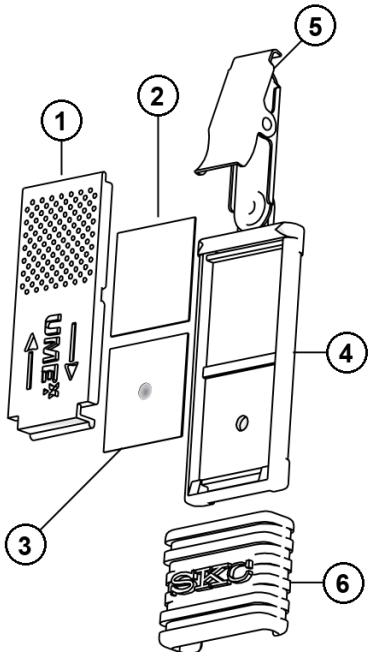


Figure 2-2. Exploded view. (1) Diffusion plate. (2) Reactive tape, sample. (3) Reactive tape, blank/correction. (4) Body. (5) Collar clip. (6) Sliding cover.

CHAPTER 3

Before use

Sampling needs no pump: you open the pouch, write the start details on the sampler, clip it in place and slide the cover open. The numbers in brackets refer to Figure 2-2 (p. 5).

Storage

- Keep unused samplers in their sealed pouches at 4 °C (39.2 °F) or below.
- Do not store samplers with food.
- Keep the pouches away from anything that may release ammonia.

Before you start

- Wear gloves whenever you handle the sampler: its tapes are chemically treated.
- Have a pen ready for the label on the back of the sampler.

NOTICE

Check the expiration date. It is on the label on the outside of the pouch. An expired sampler can give an invalid result. Do not use the sampler after the last day of the month shown.

CHAPTER 4

Procedure

Take the sample

1. Open the aluminised pouch and take out the sampler. Keep the pouch, away from any source of ammonia: the sampler goes back into it after sampling.
2. On the back of the sampler, write the date, the start time and the sampling location in the space provided.
3. For a personal sample, clip the sampler to the worker's collar with the collar clip (5). For an area sample, place it at a suitable location.
4. Slide the cover (6) to the "on" position. Sampling starts.
5. When the sampling time is over, slide the cover back to the "off" position. Sampling stops. You can sample for up to 24 hours.
6. Write the stop time on the back of the sampler.

CHAPTER 5

After use and sample handling

Send the sample

1. Put the sampler back into its original pouch straight after sampling.
2. Seal the pouch.
3. Send the sample to an accredited laboratory, together with the sampling details: date, location, start and stop times.

The laboratory should analyse the sample within 3 weeks. Until then, keep it at ambient temperature (72 °F, 22 °C) or at 4 °C (39.2 °F) or below.

Analysis

This chapter is for the laboratory. The sample and blank/correction tapes are extracted with water, and the ammonium ion is determined by ion chromatography with conductivity detection or by visible absorption spectrometry. The result is converted to ammonia and then to an airborne concentration in ppm. Wear gloves when handling the sampler and the tapes.

Calibration standards

Use commercially available ammonium standards suited to your application. From them, prepare a range of ammonium standards in de-ionised ultra-filtered (DIUF) water, in the same way as the samples, as described under Sample preparation (p. 8).

> **Note**
> **The ammonium curve is not linear.** Use a graphing program to calculate the results from the calibration curve.

Sample preparation

1. Take the sampler out of its pouch and remove the sliding cover.
2. With clean forceps, lift the treated tape out of each section and put each piece in its own sealed vial. You now have a sample and a blank/correction. The blank/correction tape is the one with the indentation.

   NOTICE

   Excessive shaking breaks the tape apart in the vial. Do not shake the vial too hard.

3. Add 3 mL of DIUF water to each vial to desorb the ammonium. Shake the vial by hand, then let it stand for 60 minutes.
4. Straight away, transfer 1 mL of the extract to an autosampler vial for the analysis.

> **Note**
> **Lot blank.** You can also correct for background with a lot blank. Each box of samplers includes one lot blank.

Ion chromatography

1. Inject 25 µL of the extract onto a Dionex CS16 column, 3 × 250 mm, with 36 mM methanesulfonic acid as the eluent.
2. Calculate the ammonium result from the standard calibration curve.

Calculating the concentration

1. Convert the ammonium result to ammonia:

   $c(NH_3)$ (µg/mL) = $c(NH_4^+)$ (µg/mL) × 0.944
2. Calculate the total mass of ammonia on each tape, with the desorption volume of 3 mL:

   m (µg) = $c(NH_3)$ (µg/mL) × 3 mL
3. Subtract the mass on the blank/correction tape from the mass on the sample tape, and convert the difference to milligrams (µg ÷ 1000).
4. Calculate the air volume sampled:

   V (L) = t (min) × 39.92 mL/min ÷ 1000
5. Calculate the airborne concentration of ammonia:

   C (ppm) = m (mg) × 24 450 ÷ (V (L) × 17.0 g/mol)

Symbol	Meaning
$c(NH_4^+)$, $c(NH_3)$	concentration of ammonium and of ammonia in the extract, in µg/mL
m	mass of ammonia; in step 5, sample minus blank/correction, in mg
t	sampling time, in minutes
39.92 mL/min	sampling rate of the UMEx 300
V	air volume sampled, in litres
17.0 g/mol	molecular weight of ammonia
C	airborne concentration of ammonia, in ppm

> **Note**
> **Always subtract the blank.** Every air concentration must be calculated from the sample tape minus the ammonia found on the blank/correction tape.

Disposal

Dispose of used samplers and their packaging under local regulations.

CHAPTER 6

Specifications

Sampling rate	39.92 mL/min, relative standard deviation 11.4 %
Validated concentration range	0.1–100 ppm
Lower detection limits	2.4 ppm for 15 minutes; 0.075 ppm for 8 hours; 0.025 ppm for 24 hours
Accuracy	±23.4 %
Sampling time	up to 24 hours
Analysis	solvent extraction; ammonium ion by ion chromatography (IC) with conductivity detection or by visible absorption spectrometry
Temperature effects	no effect on the sampling rate at 22–40 °C
Humidity effects	no effect at 20–80 % relative humidity
Wind velocity effects	no effect at 5–100 cm/s
Interferences	none identified
Shelf life	limited; see the expiration date on the pouch label
Storage before use	at 4 °C (39.2 °F) or below
Storage after use	at ambient temperature (72 °F, 22 °C) or at 4 °C (39.2 °F) or below; analyse within 3 weeks
Dimensions	3.4 × 1.1 × 0.35 in (8.6 × 2.8 × 0.89 cm)
Weight	0.38 oz (10.9 g)
Sliding cover colour	pink

CHAPTER 7

Ordering information

Order from Analyt-MTC with the order codes.

Ordering information

Description	Pack	Order code
UMEX 300 PASSIVE SAMPLER		
UMEx 300 Passive Sampler for Ammonia * † ‡	10	500-300
Treated tape, for quality control (QC) only	25	P20083
ACCESSORIES		
Stand for area sampling	1	690-302
Shelter for outdoor sampling	1	690-303
OTHER UMEX PASSIVE SAMPLERS		
UMEx 100, for formaldehyde and other aldehydes * † ‡	10	500-100
UMEx 200, for sulphur dioxide and/or nitrogen dioxide * †	10	500-200

UMEx 400 samplers, for aliphatic amines, must be stored at 4 °C (39.2 °F) or below. Ask Analyt-MTC for them.

* Limited shelf life. Do not store with food. † For single use only; do not reuse UMEx samplers. ‡ Must be stored at 4 °C (39.2 °F) or below.

CHAPTER 8

Service and contacts

Contact and support

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Before you call

Have the following at hand so that Analyt-MTC can help you quickly:

- the catalogue number of the sampler, 500-300;
- the expiration date on the pouch label;
- the sampling time you plan and the expected ammonia level.

Contact Analyt-MTC for samplers, technical questions and warranty matters concerning your SKC UMEx 300 Passive Sampler. Warranty is handled under Analyt-MTC's terms of sale. Analyt-MTC's contact details are in this chapter and on the back cover.

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