ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

# SKC Coated Filters

Storage, flow-rate verification, sampling, sample storage and shipping for the SKC coated (treated) filters, with the method, filter, coating, cassette and storage conditions of each filter, the sampling train for hydrogen peroxide and peroxyacetic acid, and the field extraction steps some methods need.

AMTC-IN-0073

Rev. 1 · October 2026

# About this document

These instructions cover the SKC coated (treated) filters, most of them preloaded in cassettes. They describe the procedure once; tables list what differs from filter to filter.

Read Safety (p. 4) first, find your filter in Table 2-1 (p. 6) by its order code, then follow Procedure (p. 11) step by step.

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

**⚠ WARNING**

A hazardous situation which, if not avoided, could result in death or serious injury.

**⚠ 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

| | |
|---|---|
| Title | SKC Coated Filters — Instructions for use |
| Document number | AMTC-IN-0073 |
| Revision | Rev. 1 — October 2026 |
| Applies to | SKC coated (treated) filters of the 225-90xx series |
| Language | English |
| Manufacturer | SKC Inc. |
| Related documents | SKC Filter Cassette Holder 225-1 — Instructions for use (AMTC-IN-0004); SKC Swinnex Sampling Kit — Instructions for use (AMTC-IN-0005) |

## Revision history

| Rev. | Date | Change |
|---|---|---|
| 1 | October 2026 | First issue. |

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CHAPTER 1

# Safety

Read this chapter before you use the filters. Its messages are repeated in the steps where they apply.

## Intended use

SKC coated filters collect airborne compounds for the sampling methods named for each filter in Table 2-1 (p. 6). Have the samples analysed by a laboratory.

## Handling acids (225-9031)

**⚠ WARNING**

**Corrosive acids.** Acids, particularly hydrofluoric acid, are extremely corrosive to skin, eyes and mucous membranes. Wear gloves, a lab coat and safety glasses while handling acids, and work only with adequate ventilation for personnel and equipment.

**⚠ WARNING**

**Violent reaction.** Mixing acid and water the wrong way round can cause a violent exothermic reaction. Always add the acid to the water.

**NOTICE**

**Hydrofluoric acid attacks glass.** Glass labware is damaged by it. Use plastic labware.

## Storage and sample quality

**⚠ CAUTION**

**Do not store with food.** Coated filters stored next to food can contaminate it, and eating contaminated food can harm you. Store the filters as Table 3-1 (p. 9) says, and never with food.

**NOTICE**

**Check the expiry date.** The coated filters have a limited shelf life, so an expired filter can give an invalid result. Use only filters within the expiry date printed on the packaging.

**NOTICE**

**Heat and sunlight (225-9002, 225-9013).** High temperatures and prolonged sunlight can damage the coating. Do not expose these coated filters to them.

**NOTICE**

**Constant 1 L/min (sampling train for hydrogen peroxide and peroxyacetic acid).** At lower flows, peroxyacetic acid reacts with the coated pre-filter and the exposure is underestimated; a higher flow typically exceeds the back-pressure capability of the pump. Maintain a constant flow rate of 1 L/min.

CHAPTER 2

# Product and supplied items

SKC coated filters are shipped preloaded in the cassettes, with end plugs and shrink bands in place. No assembly is required: they are ready to use.

Four filters are supplied as filters only, not loaded in cassettes (see Table 2-2 (p. 7)). In a preloaded cassette, a red plug secures the inlet, which is marked “inlet”, and a blue plug secures the outlet; on 225-9033 the outlet plug is pink. The Swinnex cassette is shown in Figure 4-1 (p. 11), the sampling train for hydrogen peroxide and peroxyacetic acid in Figure 4-2 (p. 12).

## The filters and their differences

Each filter is made for the methods and compounds of Table 2-1 (p. 6). Table 2-2 (p. 7) gives its filter, coating and cassette, and whether the method samples open-face or closed-face; Table 3-1 (p. 9) gives its storage conditions.

Abbreviations in the tables: IFV, SKC IFV (Inhalable Fraction and Vapour) Sampler; PI, phenyl isocyanate; IPDI, isophorone diisocyanate; HDI-BT, HDI biuret; HDI-IC, HDI isocyanurate; PTFE, polytetrafluoroethylene; DNPH, 2,4-dinitrophenylhydrazine.

**Table 2-1. Coated filters and their methods**

| Order code | Method and compounds |
|---|---|
| 225-9001 | OSHA ID 1006 for inorganic arsenic; ASTM D4765, NIOSH 7902 and OSHA ID 110 for fluorides |
| 225-9002 | OSHA 42 (modified[2]) for 1,6-hexamethylene diisocyanate (HDI), toluene-2,6-diisocyanate (2,6-TDI) and toluene-2,4-diisocyanate (2,4-TDI); OSHA 47 (modified[2]) for methylene bisphenyl isocyanate (MDI); ASTM D5836 (modified[2]) for 2,4-TDI and 2,6-TDI only |
| 225-9003 | OSHA 64 for glutaraldehyde |
| 225-9004 | NIOSH 2017[4] for aniline, nitrobenzene, o-toluidine. NIOSH 5029 and OSHA 57 for 4,4'-methylenedianiline (MDA). OSHA 65 for benzidine, 3,3'-dichlorobenzidine, toluene-2,4-diamine, 2,4-toluenediamine, 2,6-toluenediamine. OSHA 71 for o-dianisidine, 4,4'-methylenebis(2-chloroaniline) (MOCA), o-tolidine. OSHA 73 for toluidine (m-, o-, p-). OSHA 78 for diphenylamine, N-isopropylaniline. OSHA 87 for phenylenediamine (m-, o-, p-). OSHA 93 for 4-aminobiphenyl, alpha-naphthylamine, beta-naphthylamine. OSHA 105 for m-xylenediamine (mXDA), p-xylenediamine (pXDA). OSHA PV2143 for aminopyridine (2-, 3-, 4-) |
| 225-9005 | NIOSH 6004 (modified: a single three-piece cassette replaces two two-piece cassettes in series, following the 1993 NIOSH revisions) for sulfur dioxide |
| 225-9006 | NIOSH 6011 for bromine and chlorine |
| 225-9007 | OSHA 26 for methyl mercaptans; NIOSH 2542 for mercaptans (methyl-, ethyl-, n-butyl-); OSHA PV2075 for phenyl mercaptans |
| 225-9009 | OSHA 82 for acetic anhydride |
| 225-9010 | OSHA 102 for acetic anhydride; OSHA 98 for trimellitic anhydride |
| 225-9011 | MDHS 25/3 (UK) for organic isocyanates: PI, TDI, HDI, MDI |
| 225-9012 | OSHA 108 for hydrazine |
| 225-9013 | ASTM D5836 for 2,4-TDI and 2,6-TDI; OSHA 42[2] for HDI, 2,4-TDI and 2,6-TDI; OSHA 47 for MDI |
| 225-9018 | OSHA 1003 for phosphine |
| 225-9019 | OSHA 81 for crotonaldehyde |
| 225-9020 | OSHA 85 for n-valeraldehyde |
| 225-9021 | OSHA 86 for maleic anhydride |

| Order code | Method and compounds |
|---|---|
| 225-9027 | OSHA PV2055 for 1,3,5-triglycidyl isocyanurate (TGI) |
| Ask Analyt-MTC | IFV for maleic anhydride |
| Ask Analyt-MTC | Oregon OSHA Method 1010 for HDI, MDI, TDI, IPDI, HDI-BT and HDI-IC |
| 225-9030 | OSHA 1019 for hydrogen peroxide. With a sorbent tube: Non-agency Method 57 for hydrogen peroxide and peroxyacetic acid (see “Sampling train for hydrogen peroxide and peroxyacetic acid”) |
| 225-9031 | NIOSH 7906 for particulate fluorides and hydrofluoric acid |
| 225-9032 | NIOSH 7907 for hydrogen chloride, hydrogen bromide and nitric acid |
| 225-9033 | NIOSH 7908 for sulfuric acid and phosphoric acid |
| 225-9034 | OSHA 90 for phthalic anhydride |
| Ask Analyt-MTC | IFV for toluene-2,4-diisocyanate and toluene-2,6-diisocyanate |
| Ask Analyt-MTC | IFV for glyoxal |
| 225-9037 | OSHA PV2321 for peracetic acid |

### Table 2-2. Filter, coating and cassette

| Order code | Filter and coating | Cassette and sampling configuration |
|---|---|---|
| 225-9001 | Mixed cellulose-ester filter with porous plastic support pad, untreated, and cellulose support pad coated with aqueous sodium carbonate[1] | Three-piece 37-mm cassette; closed-face |
| 225-9002 | Glass fibre filter and cellulose support pad coated with 2.0 mg of 1-(2-pyridyl)piperazine | Three-piece 37-mm cassette; open-face |
| 225-9003 | 2 glass fibre filters coated with 2,4-dinitrophenylhydrazine and phosphoric acid[3] | Four-piece 37-mm cassette; open-face |
| 225-9004 | 2 glass fibre filters coated with sulfuric acid | Three-piece 37-mm cassette; closed-face |
| 225-9005 | Mixed cellulose-ester pre-filter with support pad, and cellulose filter coated with sodium carbonate with support pad | Three-piece 37-mm cassette; closed-face |
| 225-9006 | 0.5-µm PTFE pre-filter with porous plastic support pad, and a specially cleaned 0.45-µm silver membrane filter with porous plastic support pad | Three-piece 25-mm carbon-filled polypropylene cassette with cowl; closed-face[5] |
| 225-9007 | Glass fibre filter coated with mercuric acetate | Two-piece 37-mm cassette; closed-face |
| 225-9009 | 2 glass fibre filters coated with 1-(2-pyridyl)piperazine | Four-piece 37-mm cassette; closed-face |
| 225-9010 | 2 glass fibre filters coated with veratrylamine and di-n-octyl phthalate† | Four-piece 37-mm cassette; open-face |
| 225-9011 | 25-mm glass fibre filter coated with 1-(2-methoxyphenyl)piperazine | Filters only, not loaded in cassettes |
| 225-9012 | 2 extra-thick glass fibre filters coated with sulfuric acid | Three-piece 37-mm cassette; closed-face |
| 225-9013 | Glass fibre filter and cellulose support pad coated with 1-(2-pyridyl)piperazine† | Three-piece 37-mm cassette; open-face |
| 225-9018 | One glass fibre filter (untreated) and one polyester filter treated with mercuric chloride† | Three-piece 37-mm cassette; closed-face |
| 225-9019 | 2 glass fibre filters treated with 2,4-dinitrophenylhydrazine and phosphoric acid | Three-piece 37-mm cassette; open-face |
| 225-9020 | 3 glass fibre filters treated with 2,4-dinitrophenylhydrazine and phosphoric acid | Three-piece 37-mm cassette; open-face |
| 225-9021 | 2 glass fibre filters treated with veratrylamine | Three-piece 37-mm cassette; closed-face |

| Order code | Filter and coating | Cassette and sampling configuration |
|---|---|---|
| 225-9027 | Glass fibre filter coated with hydrobromic acid, and cellulose pad | Two-piece 37-mm cassette; closed-face |
| Ask Analyt-MTC IFV for maleic anhydride | 25-mm glass fibre filter coated with veratrylamine | Filters only, not loaded in cassettes |
| Ask Analyt-MTC Swinnex cassette for isocyanates | 13-mm glass fibre filter coated with 9-(N-methylaminomethyl)anthracene (MAMA) | Two-piece 13-mm Swinnex cassette wrapped in cleaned aluminium foil |
| 225-9030 | 2 quartz filters (R-100) coated with titanium(IV) oxysulfate hydrate (TiOSO4) | Two-piece 25-mm polystyrene cassette, no support pad |
| 225-9031 | One uncoated nitrocellulose filter (pre-filter) and one nitrocellulose filter coated with sodium carbonate | Three-piece 37-mm cassette; closed-face |
| 225-9032 | 2 quartz filters (R-100): one uncoated quartz pre-filter and one quartz filter coated with sodium carbonate | Three-piece 37-mm cassette; closed-face |
| 225-9033 | One uncoated quartz filter (Tissuquartz) | Two-piece 37-mm cassette; closed-face |
| 225-9034 | 2 glass fibre filters treated with veratrylamine | Four-piece 37-mm cassette; open-face |
| Ask Analyt-MTC IFV for TDI | 25-mm glass fibre filter coated with 1-(2-pyridyl)piperazine | Filters only, not loaded in cassettes |
| Ask Analyt-MTC IFV for glyoxal | 25-mm glass fibre filter coated with 2,4-dinitrophenylhydrazine | Filters only, not loaded in cassettes |
| 225-9037 | One quartz filter (R-100) coated with titanium(IV) oxysulfate hydrate (TiOSO4) | Two-piece 25-mm polystyrene cassette, no support pad |

[1] The concept of sampling fluorides in air with a double filter is patented in Canada by IRSST.

[2] OSHA Method 42 specifies a filter loading of 0.1 mg of 1-(2-pyridyl)piperazine; OSHA 47 and ASTM D5836 specify a loading of 1 mg. Coated filter 225-9002, loaded with 2 mg to increase the stability and shelf life of the filters, is acceptable for both sampling methods.

[3] The filters are light yellow and may contain orange speckles. This is a normal effect of the DNPH coating and does not affect filter performance or sampling results.

[4] NIOSH 2017 also requires the SKC sorbent tube 226-15.

[5] Use a sample pump capable of maintaining a constant flow of 1 L/min for up to 30 minutes at high back pressure. SKC recommends the AirChek TOUCH series or equivalent.

† Very limited shelf life: ask Analyt-MTC before you order.

CHAPTER 3

# Before use

## Storage and shelf life

Store each filter as Table 3-1 (p. 9) says, before and after sampling. All coated filters have a limited shelf life: check the expiry date on the packaging.

**⚠ CAUTION**

**Do not store with food.** Coated filters stored next to food can contaminate it, and eating contaminated food can harm you. Store the filters as Table 3-1 (p. 9) says, and never with food.

**NOTICE**

**Heat and sunlight (225-9002, 225-9013).** High temperatures and prolonged sunlight can damage the coating. Do not expose these coated filters to them.

### Table 3-1. Storage before and after sampling

| Order code | Before sampling | Samples, after sampling |
|---|---|---|
| 225-9001 | 22 °C (71.6 °F) | No storage stability data is available |
| 225-9002 | ≤ 4 °C (39.2 °F) | Submit the extracted samples to a laboratory as soon as possible. If a delay is unavoidable: ≤ 4 °C (39.2 °F), for up to one week |
| 225-9003 | ≤ 4 °C (39.2 °F) | In the dark, ≤ 4 °C (39.2 °F) or 22 °C (71.6 °F), for up to 17 days; refrigerated storage is recommended |
| 225-9004 | 22 °C (71.6 °F) | Refer to the methods in Table 2-1; analyse the samples as soon as possible |
| 225-9005 | 22 °C (71.6 °F) | No storage stability data is available |
| 225-9006 | 22 °C (71.6 °F) | 25 °C (77 °F), for up to 30 days, or ≤ 4 °C (39.2 °F), for up to 60 days |
| 225-9007 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days |
| 225-9009 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days |
| 225-9010 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F) or 22 °C (71.6 °F), for up to 15 days |
| 225-9011 | ≤ 4 °C (39.2 °F) | TDI: ≤ 4 °C (39.2 °F), for up to 90 days. No data is available for PI, HDI and MDI |
| 225-9012 | 22 °C (71.6 °F) | ≤ 4 °C (39.2 °F) or 22 °C (71.6 °F), for up to 19 days |
| 225-9013 | ≤ 4 °C (39.2 °F) | Submit the extracted samples to a laboratory as soon as possible. If a delay is unavoidable: ≤ 4 °C (39.2 °F), for up to one week |
| 225-9018 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F) or 22 °C (71.6 °F), for up to 17 days |
| 225-9019 | ≤ 4 °C (39.2 °F) | In the dark, at −20 °C (−4 °F). Freezer storage and shipping are required |
| 225-9020 | ≤ 4 °C (39.2 °F) | In the dark, ≤ 4 °C (39.2 °F) or 22 °C (71.6 °F), for up to 19 days; refrigerated storage and shipment to the laboratory are recommended |
| 225-9021 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days; analyse the samples as soon as possible |
| 225-9027 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 7 days |
| Ask Analyt-MTC IFV for maleic anhydride | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days |
| Ask Analyt-MTC Swinnex cassette for isocyanates | < 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 2 weeks |

| Order code | Before sampling | Samples, after sampling |
|---|---|---|
| 225-9030 | ≤ 4 °C (39.2 °F) | 21 °C (69.8 °F) or < 4 °C (39.2 °F), for up to 30 days; wrap the cassettes in the foil sheets provided to limit exposure to light |
| 225-9031 | 22 °C (71.6 °F) | 20 °C (68 °F) for 7 days, then ≤ 4 °C (39.2 °F), for up to 14 days (particulate fluorides) and 28 days (hydrofluoric acid) |
| 225-9032 | 22 °C | 22 °C (71.6 °F), for up to 7 days; for longer storage, ≤ 4 °C (39.2 °F), for up to 28 days |
| 225-9033 | 22 °C (71.6 °F) | 20 °C (68 °F), for up to 7 days, then ≤ 4 °C (39.2 °F), for up to 28 days |
| 225-9034 | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days; analyse the samples as soon as possible |
| Ask Analyt-MTC IFV for TDI | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days |
| Ask Analyt-MTC IFV for glyoxal | ≤ 4 °C (39.2 °F) | ≤ 4 °C (39.2 °F), for up to 15 days |
| 225-9037 | ≤ 4 °C (39.2 °F) | 21 °C (69.8 °F) or < 4 °C (39.2 °F), for up to 30 days; wrap the cassettes in the foil sheets provided to limit exposure to light |

## Before you start

**NOTICE**

**Check the expiry date.** The coated filters have a limited shelf life, so an expired filter can give an invalid result. Use only filters within the expiry date printed on the packaging.

1. Find your filter in Table 2-1 (p. 6) and check its sampling configuration, open-face or closed-face, in Table 2-2 (p. 7).
2. If your filters are stored at 4 °C (39.2 °F) or below, make sure that the filter cassettes, or the filters, are at room temperature before sampling.

Connecting the cassette to the sampling train and verifying the flow rate are steps 1 to 5 of Sample with a coated filter cassette (p. 11).

CHAPTER 4

# Procedure

## Sample with a coated filter cassette

These steps apply to every filter except the Swinnex cassette (see Swinnex cassette (p. 11)). For filters supplied without a cassette, the steps apply to the filter cassette you sample with; the plugs of step 1 are those of that cassette.

1. Select one coated filter cassette for verifying the flow rate. A red plug secures the inlet, which is marked “inlet”, and a blue plug (pink on 225-9033) secures the outlet.
2. Set up the sampling train for flow rate verification, with this cassette in line.
3. Remove both plugs for closed-face sampling, or the outlet plug and the cassette inlet section for open-face sampling.
4. Connect the cassette to the sampling train.
5. Verify the flow rate through the sampling train with a flowmeter.
6. Replace the cassette used to verify the flow rate with a fresh coated filter cassette for sample collection.
7. Attach the cassette to the worker’s collar, as close to the breathing zone as possible, with the filter cassette holder 225-1.
8. Sample for the specified time interval and record the time.
9. At the end of the specified sampling period, remove the filter cassette.
10. For 225-9032 and 225-9033, do the extraction in Extraction after sampling (p. 14) at this point.
11. Replace both end plugs (and the inlet, if necessary).
12. Recheck the flow rate with the same cassette and flowmeter as in step 5, to make sure that it has not changed by more than 5 %.

Sampling is complete. Store and ship the samples as After use and sample handling (p. 14) says.

## Swinnex cassette (Oregon OSHA Method 1010)

1. Select one coated filter cassette for verifying the flow rate.
2. Connect the outlet (2) to the pump with tubing of 1/8 in ID.
3. Verify the pump flow rate with a flowmeter.
4. Replace the cassette used to verify the flow rate with a fresh coated filter cassette for sample collection.
5. Attach it to the worker’s collar, as close to the breathing zone as possible.
6. At the end of the specified sampling period, remove the filter cassette.




**Figure 4-1.** Swinnex cassette. (1) Inlet. (2) Outlet, to the pump.

7. Recheck the flow rate with the same cassette and flowmeter as in step 3, to make sure that it has not changed by more than 5 %.

## Sampling train for hydrogen peroxide and peroxyacetic acid

Non-agency Method 57* samples hydrogen peroxide (HP) and peroxyacetic acid (peracetic acid, PAA) simultaneously, with coated filter 225-9030 followed by a sorbent tube.

> **Note**
> Vapour testing of this two-piece sampler by OSHA, described in Non-agency Method 57*, did not meet the OSHA requirement of > 75 %.

Assemble the sampling train as the method describes, from the following media and equipment. The numbers in brackets refer to Figure 4-2 (p. 12).

1. Pre-filter 225-9030 (1), worn on the collar with its clip and cable tie (2), collects HP: 2 quartz filters (R-100) coated with titanium oxysulfate hydrate, preloaded in a 25-mm two-piece polystyrene cassette with no support pad.
2. Tygon tubing 225-1345, 1/4 in ID × 3/8 in OD, connects the pre-filter cassette to the sorbent tube. Figure 4-2, drawn after the source figure, labels this tubing PTFE tubing; the source's parts list specifies Tygon tubing 225-1345, so use the tubing listed here and in Ordering information (p. 17).
3. Sorbent tube 226-193-UC or 226-199-UC (4) collects PAA. 226-193-UC (single section): 7 × 110-mm glass tube containing 800 mg of silica gel coated with methyl p-tolylsulfoxide (MTSO), with two glass wool separators. 226-199-UC (two sections): 8 × 110-mm glass tube containing 800/200 mg of silica gel coated with MTSO, with two glass wool separators and a glass fibre filter separating the sections.
4. Tube holder (non-adjustable) with tubing 222-3L-1 (5), connects the sorbent tube to the sample pump inlet (7); the tubing is 1/4 in ID × 3/8 in OD.
5. Sample pump (8) capable of maintaining a constant flow of 1 L/min for up to 30 minutes at high back pressures. SKC recommends the AirChek TOUCH series.

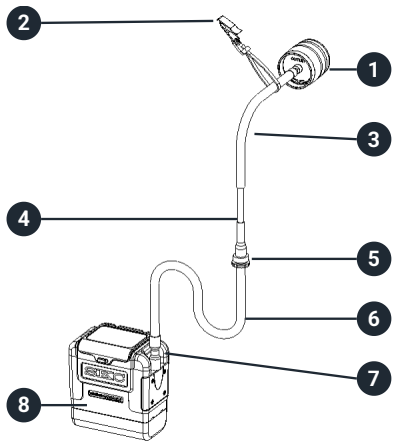



**Figure 4-2.** Sampling train for hydrogen peroxide and peroxyacetic acid. (1) Filter cassette. (2) Collar clip and cable tie. (3) PTFE tubing. (4) Sorbent tube. (5) Tube holder (non-adjustable). (6) Tygon tubing. (7) Pump inlet. (8) Sample pump.

### Flow rate

**NOTICE**

**Constant 1 L/min.** At lower flows, peroxyacetic acid has time to react with the coated pre-filter, and the exposure is underestimated; a higher flow typically exceeds the back-pressure capability of the pump. Maintain a constant flow rate of 1 L/min to get good recoveries of PAA.

1. Verify the flow rate through the sampling train before sampling.
2. Sample at a constant 1 L/min.
3. Verify the flow rate through the sampling train after sampling.

### Storing the sorbent tubes

Before sampling, the sorbent tubes 226-193-UC and 226-199-UC may be stored at ≤ 4 °C (39.2 °F); their shelf life is limited, so check the expiry date on the packaging. After sampling, samples on the sorbent tubes may be stored at ≤ 4 °C (39.2 °F) for up to 3 weeks. For the coated filter 225-9030, see Table 3-1 (p. 9).

* Hecht, G., Hery, M., Hubert, G., and Subra, I., “Simultaneous Sampling of Peroxyacetic Acid and Hydrogen Peroxide in Workplace Atmospheres”, Ann. occup. Hyg., 2004, 48(8), pp. 715–721.

CHAPTER 5

# After use and sample handling

## Extraction after sampling

Four filters need an extraction step before shipping. For all other filters, go to Storing and shipping the samples (p. 15).

### 225-9031, NIOSH 7906

**⚠ WARNING**

**Corrosive acids.** Acids, particularly hydrofluoric acid, are extremely corrosive to skin, eyes and mucous membranes. Wear gloves, a lab coat and safety glasses while handling acids, and work only with adequate ventilation for personnel and equipment.

**⚠ WARNING**

**Violent reaction.** Mixing acid and water the wrong way round can cause a violent exothermic reaction. Always add the acid to the water.

**NOTICE**

**Hydrofluoric acid attacks glass.** Glass labware is damaged by it. Use plastic labware.

1. Remove the filters from the cassette.
2. Place the filters in screw-cap plastic vessels.
3. For the pre-filter portion: with approximately 2 mL of eluent (extraction) solution (8 mM $Na_2CO_3$/1 mM $NaHCO_3$), rinse material from the inside surfaces of the pre-filter portion of the cassette into the vessel.
4. Add eluent solution into the vessels until a final volume of 10 mL is reached.
5. For each set of samples collected per day, take at least three blank untreated filters and three blank impregnated filters as field blanks.
6. Place each blank filter into a vessel and add 10 mL of eluent solution.
7. Ship the field blanks to the laboratory with the samples.

### 225-9032, NIOSH 7907

1. At the end of the sampling period, remove the pre-filter portion of the filter cassette.
2. Rinse it with 2 mL of eluent (extraction) solution (3.1 mM $Na_2CO_3$/0.35 mM $NaHCO_3$).
3. Bring the solution to a final volume of 5 mL.
4. Continue with step 11 of Sample with a coated filter cassette (p. 11).

### 225-9033, NIOSH 7908

1. At the end of the sampling period, remove the filter from the cassette with PTFE-coated tweezers.
2. Place the filter in a 10-mL screw-cap plastic vessel.
3. With about 2 mL of eluent (extraction) solution (0.0027 M $Na_2CO_3$/0.0003 M $NaHCO_3$), rinse material from the inside surfaces of the cassette into the vessel.

4. Add eluent solution into the vessel until a final volume of 5 mL is reached.
5. Continue with step 11 of Sample with a coated filter cassette (p. 11).

### 225-9013, field extraction

1. Put on disposable gloves.
2. Remove the cassette inlet section.
3. Remove the filter from the cassette with clean forceps.
4. Place the filter in a glass vial containing field extraction solution, following the procedure in Appendix B of OSHA Directive CPL 03-00-017 (National Emphasis Program – Occupational Exposure to Isocyanates).

## Storing and shipping the samples

1. Store the samples as Table 3-1 (p. 9) says.
2. Check that both end plugs are in place on each filter cassette (step 11 of Sample with a coated filter cassette (p. 11)).
3. Appropriately package the filter cassettes, samples, blanks and all pertinent data.
4. Ship them to a laboratory for analysis.

Expedite shipping of the samples to the laboratory; Friday shipments are not recommended. For 225-9019, freezer shipping is required; for 225-9020, refrigerated shipment to the laboratory is recommended.

225-9002 and 225-9013: submit the extracted samples to a laboratory as soon as possible after sampling; if a delay is unavoidable, store them at ≤ 4 °C (39.2 °F) for up to one week. Refrigerated shipment is not required. Follow all applicable hazardous materials shipping restrictions and requirements; see Appendix B of OSHA Directive CPL 03-00-017 for details.

## Disposal

Dispose of used coated filters and their packaging under local regulations.

CHAPTER 6

# Specifications

The values below apply to the coated filters as a family. The values per filter are in Table 2-2 (p. 7) (filter, coating and cassette) and Table 3-1 (p. 9) (storage before and after sampling).

### Table 6-1. Coated filters

| | |
|---|---|
| **Filter diameter** | 13 mm, 25 mm or 37 mm, per filter |
| **Cassette** | Two-, three- or four-piece, preloaded, with end plugs and shrink bands in place; four filters are supplied as filters only, not loaded in cassettes |
| **Coating loading, 225-9002** | 2.0 mg of 1-(2-pyridyl)piperazine |
| **Filter pore size, 225-9006** | 0.5 µm PTFE pre-filter; 0.45 µm silver membrane filter |
| **Flow rate, 225-9006 and sampling train for hydrogen peroxide and peroxyacetic acid** | Constant 1 L/min for up to 30 minutes at high back pressure |
| **Flow rate change during sampling** | Not more than 5 % |
| **Storage before sampling** | 22 °C (71.6 °F) or ≤ 4 °C (39.2 °F), per filter |
| **Shelf life** | Limited; expiry date on the packaging |

### Table 6-2. Sorbent tubes for peroxyacetic acid

| | |
|---|---|
| **226-193-UC** | 7 × 110-mm glass tube, 800 mg of silica gel coated with MTSO, single section |
| **226-199-UC** | 8 × 110-mm glass tube, 800/200 mg of silica gel coated with MTSO, two sections |
| **Storage** | Before sampling ≤ 4 °C (39.2 °F); samples ≤ 4 °C (39.2 °F), for up to 3 weeks |

CHAPTER 7

# Ordering information

Order from Analyt-MTC with the order codes.

| Description | Order code |
|---|---|
| **COATED FILTERS** | |
| Inorganic arsenic and fluorides | 225-9001 |
| Isocyanates (HDI, TDI, MDI), 2.0 mg loading | 225-9002 |
| Glutaraldehyde | 225-9003 |
| Aromatic amines | 225-9004 |
| Sulfur dioxide | 225-9005 |
| Bromine and chlorine | 225-9006 |
| Mercaptans | 225-9007 |
| Acetic anhydride, OSHA 82 | 225-9009 |
| Acetic and trimellitic anhydride† | 225-9010 |
| Organic isocyanates, MDHS 25/3; filters only | 225-9011 |
| Hydrazine | 225-9012 |
| Isocyanates (HDI, TDI, MDI)† | 225-9013 |
| Phosphine† | 225-9018 |
| Crotonaldehyde | 225-9019 |
| n-valeraldehyde | 225-9020 |
| Maleic anhydride, OSHA 86 | 225-9021 |
| Triglycidyl isocyanurate (TGI) | 225-9027 |
| Hydrogen peroxide | 225-9030 |
| Particulate fluorides and hydrofluoric acid | 225-9031 |
| Hydrogen chloride, hydrogen bromide, nitric acid | 225-9032 |
| Sulfuric acid and phosphoric acid (uncoated filter) | 225-9033 |
| Phthalic anhydride | 225-9034 |
| Peracetic acid | 225-9037 |
| Maleic anhydride, IFV; filters only | Ask Analyt-MTC |
| Isocyanates, Oregon OSHA 1010; Swinnex cassette | Ask Analyt-MTC |
| TDI, IFV; filters only | Ask Analyt-MTC |
| Glyoxal, IFV; filters only | Ask Analyt-MTC |
| **ACCESSORIES** | |
| Filter cassette holder | 225-1 |
| Sorbent tube for NIOSH 2017, with 225-9004 | 226-15 |
| Sorbent tube for peroxyacetic acid, single section | 226-193-UC |
| Sorbent tube for peroxyacetic acid, two sections | 226-199-UC |
| Tygon tubing, 1/4 in ID × 3/8 in OD | 225-1345 |
| Tube holder (non-adjustable) with tubing | 222-3L-1 |

† Very limited shelf life: ask Analyt-MTC before you order. All coated filters have a limited shelf life; pack sizes: ask Analyt-MTC.

CHAPTER 8

# Service and contacts

## Contact and support

**ANALYT-MTC Messtechnik GmbH**

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**Before you call**

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

- the order code of the filters;
- the lot number and expiry date on the packaging;
- the sampling method you work to.

Contact Analyt-MTC for coated filters for other methods, technical questions and warranty matters concerning your SKC coated filters. Warranty is handled under Analyt-MTC's terms of sale. Analyt-MTC's contact details are in this chapter and on the back cover.

**ANALYT-MTC Messtechnik GmbH**

Sales, service and calibration

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AMTC-IN-0073 · Rev. 1 · 2026-10

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