ANALYT MESSTECHNIK



REFERENCE GUIDE

SKC Sorbent Tubes

Flow rates, preparation, sampling, storage, shipping to the laboratory and analysis of SKC glass sorbent tubes, with the breakthrough check on the backup section.

AMTC-RF-0008

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About this guide

A sorbent tube collects gases and vapours from air that a sample pump draws through it. The result is only as good as the handling: a tube that picks up vapour before the sample starts, sits at an angle in the holder, or waits too long in a warm room before analysis gives a wrong figure, and nothing in the laboratory report shows it. This guide sums up the handling rules for SKC glass sorbent tubes, from opening the tube to reading the result.

The sorbent tube (p. 5) explains how a tube is built and how fast air may pass through it. Preparing and taking the sample (p. 6) and Storage, shipping and analysis (p. 8) follow the tube through a sampling day in order. The sampling method you work to sets the tube type, the flow rate and the air volume; this guide does not replace it, nor the manual of your sample pump.

How to read the tables

The flow-rate table gives each tube size as outside diameter × length in mm, then the typical and the maximum flow rate in mL/min. The breakthrough table sets the amount found on the backup section against the amount on the main section and says what the result means. In Ordering information the items are grouped by task, each with its order code.

Abbreviations

OD	Outside diameter
GC-MS	Gas chromatography with mass-spectrometric detection
PUF	Polyurethane foam
OVS	OSHA Versatile Sampler

How this guide marks information

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

The sorbent tube

A sorbent tube is a glass tube, sealed at both ends, that holds two beds of sorbent: a large main section that collects the sample and a smaller backup section behind it that shows whether the main section was overloaded.

Plugs of glass wool and a separator of foam or glass wool keep the beds apart and give the tube an even pressure drop; a lockspring holds them in place so that air cannot channel past the sorbent and the sample stays put in transport. The sorbent itself — its particle size, pore size and surface area — is chosen for the substances the tube is meant to collect. Some tubes are treated for one analyte, others are for general use: if you are not sure a tube suits your substance, ask Analyt-MTC **before** you sample.

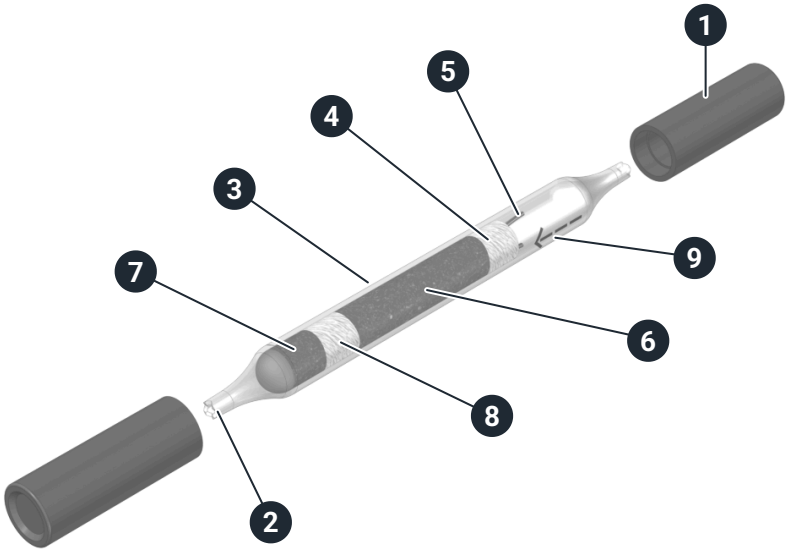


Figure 1-1. Sorbent tube, end caps removed. (1) Sealing cap, one for each end. (2) Sealed glass tip, broken off to open the tube; the opening must be at least 2 mm across. (3) Glass tube. (4) Glass wool plug. (5) Lockspring. (6) Main sorbent section. (7) Backup sorbent section. (8) Separator, foam or glass wool. (9) Arrow: the direction of the air flow, toward the tube holder and the pump.

Flow rates

The tube size is the outside diameter by the length. Set the flow rate the method specifies; it normally lies in the typical range. Never set a flow rate above the maximum for the tube size.

Tube size (OD × length)	Typical flow rate	Maximum flow rate
6 × 70 mm	10–100 mL/min	500 mL/min
6 × 110 mm	20–100 mL/min	500 mL/min
8 × 110 mm	20–200 mL/min	1000 mL/min

Note
Check in the manual of your pump whether it reaches these flow rates on its own or needs an adjustable low flow tube holder (224-26-01 for a single tube; see Ordering information (p. 9)).

CHAPTER 2

Preparing and taking the sample

A sorbent tube starts collecting the moment it is open. Everything it takes up before the sample starts ends up in the result, so open, fit and check the tube where the air is clean.

NOTICE

Stray vapour. An open tube takes up stray vapour before the sample starts, and everything it takes up ends up in the result. Prepare tubes in clean air. Residue left on a lab coat by earlier work is a frequently missed cause of such uptake. Never open a tube, fit it in the holder or calibrate with it in an area where chemicals may be present. Wear clothing free of contamination while you handle tubes.

Open and fit the tube

1. Break off both sealed tips of the tube. The opening at each end must be at least 2 mm across, or half the diameter of the tube body.
2. Fit the tube in the tube holder with the arrow on the glass pointing toward the holder (Figure 1-1 (p. 5)). If the tube has no arrow, fit it with the smaller sorbent section, the backup section, nearest the holder.

   Note
   A red cap pushed fully home cannot be pulled off again; it has to be cut off. Push caps fully home only after sampling, to seal the tube.

3. Cover the exposed end, the sampling inlet, with a red end cap until the sample starts. Press the cap on only **lightly**.

Note
A tube breaker retains the broken glass tips instead of leaving them loose. See Ordering information (p. 9).

Take the sample

NOTICE

Tilted tube. A tube at an angle lets the air channel past the sorbent, and the result reads low. Hold the tube vertical: for occupational hygiene and environmental sampling, always use the tube in an upright position.

1. Set the flow rate the method specifies, within the range in Flow rates (p. 5), and verify it as the manual of your pump describes.
2. At the sampling point, take the temporary cap off the sampling inlet and start the pump.
3. When the sample is complete, stop the pump and straight away seal both ends of the tube with the red plastic caps supplied. Press them fully home so that they seal.
4. Get the tube to the laboratory as soon as you can; see Storage, shipping and analysis (p. 8).

Moisture, heat and tubes in series

- High temperature or high humidity can change how well the sorbent takes up the sample.

- In very moist air, put a trap tube in front of the sorbent tube.
- You can connect sorbent tubes in series.

CHAPTER 3

Storage, shipping and analysis

The sample on the sorbent does not keep for ever. Have every tube analysed at the earliest opportunity after sampling; until then, store it cold and away from chemicals.

Store the tubes

NOTICE

A used tube can pick up chemicals from its surroundings, even with its end caps fitted, and the result is then invalid. Do not leave a used tube where chemicals may be present, above all chemicals similar to the ones you sampled.

- For anything longer than a few hours, keep the tubes in a refrigerator at 0 °C. Sampled tubes keep there for up to 1 week.
- Whether a longer storage time is possible depends on the substance sampled. Ask Analyt-MTC or your laboratory.
- Store a blank with the samples, in the same way. A blank is a tube with both ends broken off and capped, but not used for sampling. The laboratory analyses the blank first: a clean blank confirms that the tubes picked up nothing in storage.

Send the tubes to the laboratory

1. Pack the capped tubes in a clean container, a clean plastic bottle for example, rather than loose in the envelope.
2. Add one unopened tube from the same batch.
3. Add one blank: a tube from the same batch with both ends broken off and capped, but not used for sampling.

Analysis and the breakthrough check

These points are for the laboratory: pass them on if you do not analyse the tubes yourselves.

- Take **all** the sorbent out of the tube, with a charcoal pick if needed. Some synthetic sorbents tend to stick to the glass.
- For analysis by GC-MS, use only tubes with glass wool separators. GC-MS demands strict handling throughout, and blanks are essential.
- Analyse the main section and the backup section separately, and compare the amounts of analyte on them (table below).

Reading the backup section

Amount on the backup section	What the result means
Less than 25 % of the amount on the main section	No breakthrough. The sum of both sections is a valid result, for example 10 µg.
More than 25 % of the amount on the main section	**Breakthrough:** the main section was overloaded. Report the result only as greater than the sum of both sections.

Where the method sets its own breakthrough criterion, that criterion applies.

CHAPTER 4

Ordering information

Order from Analyt-MTC with the order codes. Analyt-MTC supplies SKC sorbent tubes and the hardware to use them: tube breakers, tube holders, protective tube covers and tools, as well as the sample pumps and flowmeters.

Item	Order code
OPENING TUBES AND REMOVING THE SORBENT	
All-in-one tube breaker, stainless steel, for tubes of 6, 7, 8 and 10 mm OD; its cap keeps the broken glass tips	226-03-055
Tube scorer/breaker for tubes of 6 mm OD; keeps the broken glass tips	GST_722
Charcoal pick, to loosen and take out the sorbent	222-3-20
HOLDING THE TUBE AT THE PUMP	
Adjustable low flow tube holder, single (all pumps except Pocket Pump TOUCH)	224-26-01
Adjustable low flow tube holder, double, triple, quadruple	224-26-02, -03, -04
PROTECTING THE TUBE	
Protective tube covers, types A to D, for tubes from 6 mm OD × 70 mm to 10 mm OD × 220 mm	224-29A to 224-29D

For constant pressure controllers, low flow adaptor kits and the covers for OVS and PUF tubes, ask Analyt-MTC.

CHAPTER 5

Contacts

Contact and support

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Before you call

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

- the substances you sample for and the method you work to;
- the catalogue number and lot of the sorbent tubes;
- the sample pump and tube holder you use.

Contact Analyt-MTC to choose a sorbent tube for a substance or method, for questions on storage times, and for warranty matters, which follow Analyt-MTC's terms of sale. Analyt-MTC's contact details are in this chapter and on the back cover.

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