ANALYT MESSTECHNIK



INSTRUCTIONS FOR USE

SKC Button Aerosol Sampler

Filter loading, flow-rate verification, sampling, cleaning and autoclaving for the SKC Button Aerosol Sampler, catalogue number 225-360, for inhalable dust and bioaerosols at 4 L/min.

AMTC-IN-0003

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About this document

These instructions explain how to use the SKC Button Aerosol Sampler, catalogue number 225-360, to collect inhalable dust and bioaerosols on a 25 mm filter at 4 L/min. They cover the parts of the sampler, the choice of filter, loading the filter, checking the flow rate, taking a personal or area sample, sending the filter to the laboratory, and cleaning and autoclaving the sampler afterwards.

Start with the first two chapters, Safety (p. 4) and Product and supplied items (p. 5), then follow Before use (p. 7) and Procedure (p. 8) step by step. After use and sample handling (p. 9) covers sending the filter, analysis and cleaning; Ordering information (p. 11) lists the order codes.

You also need a sample pump that holds 4 L/min and a flowmeter (calibrator); follow their own operating instructions for setting and reading the flow. The sampling and analytical method you work to decides the filter type and the laboratory procedure.

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

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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Revision history

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. It states what the sampler is intended for and brings together the safety messages of these instructions.

Intended use

The Button Sampler collects the inhalable fraction of airborne particles, dust and bioaerosols, on a 25 mm filter. It serves for personal sampling, clipped close to the breathing zone of a worker, and for area sampling. Use it with a sample pump at 4 L/min (see Product and supplied items (p. 5)).

Safety messages

The messages in these instructions protect the filter and the sampler. Each one is repeated at the step it concerns, in Load the filter (p. 7) and Cleaning and autoclaving (p. 9).

NOTICE

Too much force on the inlet section twists the filter. A twisted filter can tear. Do not overtighten the inlet section.

NOTICE

Autoclaving can damage the collar clip and the BUNA-N O-ring. Remove both before the sampler goes into the autoclave.

NOTICE

Personal sample pumps can only overcome a limited back pressure, and filters with a pore size below 1.0 µm may not hold 4 L/min for the whole sample. Prefer a pore size of 1.0 µm or larger.

CHAPTER 2

Product and supplied items

The Button Sampler is a reusable 25 mm filter holder with a domed, porous inlet. At 4 L/min it closely follows the ISO 7708/CEN inhalability convention, so it collects the inhalable fraction of airborne particles: dust less than 100 µm aerodynamic diameter, and bioaerosols for viable or non-viable analysis.

The design keeps the sensitivity to wind low and spreads the particles evenly over the filter, so the variation between samples stays small. You can use the sampler in any orientation. Very large particles, above 100 µm, are thought to be less inhalable but can still reach the inlet of some samplers by projection or settling; the shape of the Button Sampler keeps most of them out.

Parts

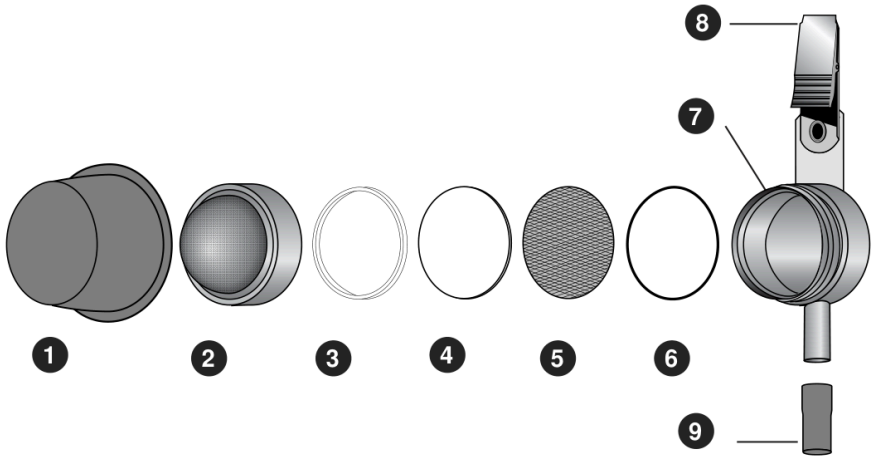


Figure 2-1. Exploded view. (1) Cap. (2) Inlet section, stainless steel. (3) PTFE O-ring. (4) 25 mm filter. (5) Support screen. (6) BUNA-N O-ring. (7) Body. (8) Collar clip. (9) Outlet plug.

The filter (4) lies on the support screen (5) in the body (7) and is held by the PTFE O-ring (3) under the screwed-on inlet section (2). The BUNA-N O-ring (6) seals the body. The pump tubing connects to the outlet on the underside of the body. The cap (1) fits over the inlet and the outlet plug (9) into the outlet.

Choosing the filter

The analysis decides the filter. Inhalable dust is weighed (gravimetric analysis, for example to NIOSH Method 0500). Metals can be measured on the filter by X-ray fluorescence (XRF; for example NIOSH Method 7702), or by atomic absorption (AA) or ICP. Fungal spores are determined by epifluorescence microscopy, immunoassay or polymerase chain reaction (PCR).

Filter, 25 mm	Pore size	Pack	Order code
Glass fibre	1.0 µm	500	225-702
PTFE with PMP support ring [a, b]	3.0 µm	50	225-1711
Polyvinyl chloride (PVC)	5.0 µm	100	225-5-25
Mixed cellulose ester (MCE)	1.2 µm	100	225-1912
Gelatin, sterilised [c]	—	50	225-9551
Polycarbonate	0.8 µm	100	225-1601

(a) Back pressure can vary between PTFE filters of the same lot. (b) Maximum operating temperature 464 °F (240 °C), set by the PMP support ring. (c) Gelatin filters dissolve when placed on agar.

NOTICE

Personal sample pumps can only overcome a limited back pressure, and filters with a pore size below 1.0 µm may not hold 4 L/min for the whole sample. Prefer a pore size of 1.0 µm or larger.

Bioaerosols

For bacteria, fungal spores and other bioaerosols, choose the filter by the analysis:

- **non-viable analysis**: a membrane filter such as MCE or PVC;
- **viable analysis**: an SKC gelatin filter, which helps stress-sensitive microorganisms survive the sampling;
- **several bioaerosols in one sample**: an SKC polycarbonate filter.

For personal inhalable sampling to the ISO 7708/CEN convention, the pump must hold 4 L/min with the chosen filter.

CHAPTER 3

Before use

A sample run has four parts: load a filter, check the flow rate of 4 L/min with a representative filter, take the sample with a fresh filter, and send the filter to the laboratory. Check the flow with the sampler in the sampling train, using the calibration adapter 225-361.

Load the filter

> **Note**
> Wear gloves, and handle filters with forceps only.

1. For gravimetric sampling, condition and weigh a 25 mm filter as your method specifies. A representative filter that you use only to check the flow rate does not need conditioning or weighing.
2. Turn the inlet section anticlockwise until it comes off the body, and lift out the PTFE O-ring.
3. Lay the filter on the support screen inside the body.
4. Lay the PTFE O-ring on top of the filter.

NOTICE

Too much force on the inlet section twists the filter. A twisted filter can tear. Do not overtighten the inlet section.

5. Put the inlet section back and turn it clockwise, very gently, until it is moderately tight.

Check the flow rate

1. Load a representative filter. Switch the pump on and let it run for 5 minutes before you check the flow through the sampling train.
2. Connect the outlet of the Button Sampler to the inlet of the sample pump with flexible tubing.
3. Push the outlet of the calibration adapter onto the inlet of the sampler, and connect the inlet of the adapter to the flowmeter.
4. Check that the flow rate is 4 L/min, following the operating instructions of the pump and of the flowmeter.
5. Disconnect the flowmeter and remove the calibration adapter.
6. Replace the representative filter with a fresh filter, conditioned and weighed, for the sample (see Load the filter (p. 7)).

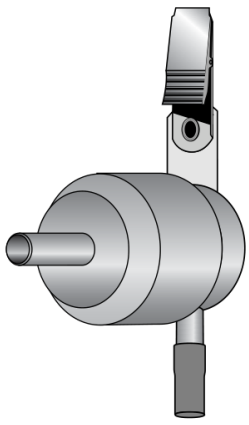


Figure 3-1. Button Sampler with the calibration adapter fitted. The spigot on the left goes to the flowmeter; the outlet at the bottom goes to the pump.

CHAPTER 4

Procedure

Take the sample

1. Make sure the flow rate has been checked (see Check the flow rate (p. 7)).
2. Connect the outlet of the Button Sampler to the inlet of the sample pump with flexible tubing. Suitable pumps include the SKC AirChek XR5000 and the SKC AirChek TOUCH series.
3. **Personal sample:** clip the sampler to the worker's collar or pocket, close to the breathing zone.
   Area sample: place the sampler where cross-drafts do not reach it and particles cannot be thrown straight into the inlet.
4. **Personal sample:** clip the pump to the worker's belt or put it in a protective pouch.
5. Start the pump.
6. Write down the start time, the worker or location, and the flow rate.
7. At the end of the sampling period, stop the pump.
8. Write down the stop time.

CHAPTER 5

After use and sample handling

Remove and send the sample

1. Unscrew the inlet section very gently. Lift out the PTFE O-ring with forceps.
2. Take the filter out of the sampler carefully, with forceps.
3. Pack the filter as the method or the laboratory specifies.
4. Send it, with the sampling information that belongs to it, to an accredited laboratory for analysis.

Analysis

The hazard you measure decides the analysis. Dust is weighed; metals are determined by XRF, atomic absorption (AA) or inductively coupled plasma (ICP); fungal spores, endotoxin and bacteria by growth culture, microscopy or other assays.

In gravimetric analysis, the dust collected is the filter weight after sampling minus the weight before.

Cleaning and autoclaving

Clean the sampler

Clean every part of the Button Sampler in mild soapy water before you use it again. You can brush the parts or wipe them with a clean, dust-free tissue, and then let them dry in air, blow them dry or wipe them with isopropyl alcohol. Take particular care when you clean the PTFE O-ring.

Autoclave the sampler

The sampler and the calibration adapter 225-361 can be autoclaved at up to about 273.2 °F (134 °C).

NOTICE

Autoclaving can damage the collar clip and the BUNA-N O-ring. Remove both before the sampler goes into the autoclave.

1. Remove the collar clip (8 in Figure 2-1 (p. 5)) with a Phillips screwdriver.
2. Take the BUNA-N O-ring (6) off the body.
3. Autoclave the sampler at no more than about 273.2 °F (134 °C).

Disposal

Dispose of the sampler under local regulations; separate metal, glass and plastic parts for recycling where possible.

CHAPTER 6

Specifications

Key data

Flow rate	4 L/min (follows the ISO 7708/CEN inhalability curve)
Particle size	inhalable fraction, less than 100 µm aerodynamic diameter
Filter	25 mm diameter, type as the method specifies
Sampling inlet	conductive stainless steel
Body	aluminium
Support screen	stainless steel
Collar clip	stainless steel and nylon
O-rings	PTFE (inlet), BUNA-N (body)
Autoclavable	up to about 273.2 °F (134 °C), without the collar clip and the BUNA-N O-ring
Tubing	1/4 in inside diameter

Further reading

- Kalatoor, S., Grinshpun, S., Willeke, K.: New aerosol sampler with low wind sensitivity and good filter collection uniformity. *Atmospheric Environment* 29 (10), 1995, pp. 1105–1112.
- Hauck, B., Grinshpun, S., Reponen, A., Reponen, T., Willeke, K., Bornschein, R.: Field testing of new aerosol sampling method with a porous curved surface as inlet. *American Industrial Hygiene Association Journal* 58 (10), 1997, pp. 713–719.
- Aizenberg, V., Grinshpun, S., Willeke, K., Smith, J., Baron, P. A.: Performance characteristics of the button personal inhalable aerosol sampler. *AIHA Journal* 61, May/June 2000, pp. 398–404.
- Wang, C., et al.: Field evaluation of personal sampling methods for multiple bioaerosols. Published 23 March 2015, DOI 10.1371/journal.pone.0120308.

CHAPTER 7

Ordering information

Order from Analyt-MTC with the order codes.

Description	Pack	Order code
SAMPLER AND KIT		
Button Aerosol Sampler; requires a 25 mm filter	1	225-360
Button Sampler pump kit: Button Sampler, standard XR5000 sample pump, single charger with cable (100–240 V), 3 ft of Tygon tubing and calibration adapter; requires a 25 mm filter	1	Ask Analyt-MTC
ACCESSORIES AND SPARE PARTS		
Calibration adapter for the Button Sampler	1	225-361
Filter transport case, for 25 mm filters, conductive plastic	10	225-67-10
Replacement O-ring, PTFE	1	P32265
Replacement O-ring, BUNA-N	50	P31891
Support screen, 25 mm	1	P26034

Filters: see Choosing the filter (p. 6).

CHAPTER 8

Service and contacts

Contact and support

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www.analyt-mtc.com

Before you call

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

- the catalogue number of the sampler or part (for example 225-360);
- the filter type and the method you sample to;
- the sample pump and flowmeter you use.

Contact Analyt-MTC to order samplers, filters and spare parts, and for technical support with your SKC Button Aerosol Sampler. Warranty matters and returns are handled under Analyt-MTC's terms of sale. Analyt-MTC's contact details are above and on the back cover.

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