



Operating Instructions

863 Valley View Road, Eighty Four, PA 15330 USA
Tel: 724-941-9701 • www.skcinc.com

Button Aerosol Sampler Cat. No. 225-360

The SKC Button Aerosol Sampler is a reusable filter sampler with a porous curved-surface sampling inlet designed to improve the collection characteristics of inhalable dust (< 100- μm aerodynamic diameter[†]) including bioaerosols for viable or non-viable analysis.



SKC Button Aerosol Sampler

While closely following the ISO 7708/CEN sampling criteria for inhalable particulate mass at 4 L/min, the Button Sampler's design also minimizes wind sensitivity, provides equal distribution of particle loading and low intersample variation, and can be used in any orientation. Sample analysis for inhalable dust is performed gravimetrically using NIOSH Method 0500. Metals can be analyzed using direct-reading techniques (e.g., NIOSH 7702). Fungal spore analysis includes microscopy, immunoassay, or polymerase chain reaction (PCR).

[†] *Very large particles (> 100 μm) are thought to be less inhalable but may enter the inlets of some samplers by projection or sedimentation. The Button Aerosol Sampler design minimizes collection of these particles.*

Performance Profile

Flow Rate: 4 L/min. The Button Sampler closely follows the ISO 7708/CEN inhalability curve at 4 L/min. This provides optimum sampling.

Construction: Sampling inlet: conductive stainless steel
Body: aluminum
Support screen: stainless steel
Clip: stainless steel and nylon
O-rings: PTFE (inlet) and BUNA-N (body)

Filters: 25 mm select as specified by the method

Analysis: Inhalable dust: Gravimetric (GR)
Fungal spores: Epifluorescence microscopy, immunoassay, or polymerase chain reaction (PCR)
Metals: X-ray Fluorescence (XRF)

Autoclavable: Up to approximately 273.2 F (134 C). Collar clip and BUNA-N O-ring should **not** be autoclaved. See page 3.[‡]

Tubing: 1/4-in ID

Operation

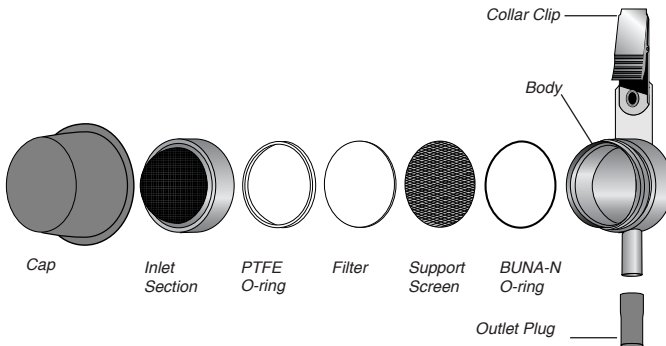
Wear gloves and use forceps when handling filters.

1. For gravimetric sampling, condition and weigh a 25-mm filter according to method used.
2. Unscrew the inlet of the sampler counterclockwise until it comes off and remove the PTFE O-ring.
3. Place the 25-mm filter on top of the support screen inside the sampler.

Note: Representative filters used for calibration do not require conditioning and weighing.

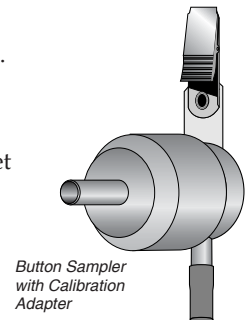
4. Place the PTFE O-ring on top of the filter.
5. Replace the inlet and **very gently** turn clockwise until moderately tight.

 **Excessive tightening of the inlet section can twist and tear the filter.**



Calibration

1. Ensure pump has run for 5 minutes before calibrating.
2. Using flexible tubing, connect the outlet of the Button Sampler to the inlet of a sample pump.
3. Place the calibration adapter outlet onto the Button Sampler inlet, and connect the calibration adapter inlet to a calibrator.
4. Calibrate to 4 L/min following the instructions in the pump and calibrator operating instructions.
5. Disconnect the calibrator and calibration adapter. Replace the filter used to set the flow rate with a fresh conditioned and weighed filter for sample collection.



Sampling

1. Ensure the flow rate has been calibrated. *See Calibration.*
2. Using flexible tubing, connect the outlet of the Button Sampler to the inlet of a sample pump such as an AirChek® XR5000 or AirChek TOUCH.
3. For personal sampling, clip the Button Sampler onto a worker's collar or pocket near the breathing zone. Clip the pump onto the worker's belt or place it in a protective pouch. Start the pump and record the start time, worker location, and flow rate.
4. For area sampling, position the Button Sampler to avoid cross-drafts and direct projection of the particles into the inlet.
5. At the end of the sampling period, stop the pump and record the stop time.

Sample Shipment

1. When sampling is complete, very gently unscrew the sampler inlet and use forceps to remove the PTFE O-ring.
2. Using forceps, carefully remove the filter from the sampler.
3. Package for shipment as directed by the method or laboratory.
4. Ship samples with pertinent sampling information to an accredited laboratory for analysis.

Analysis

Dependent upon the hazard of interest, samples taken with the Button Sampler can be analyzed using gravimetric analysis, analytical techniques such as x-ray fluorescence, atomic absorption (AA), or inductively coupled plasma (ICP). Growth culture, microscopy, and other assays may be used for the determination of fungal spores, endotoxin, and bacteria.

If gravimetric analysis is used, weigh the filter and subtract the preweight from the postweight. The net weight will be the dust collected.

Using the Button Sampler to Collect Inhalable Bioaerosols

The SKC Button Aerosol Sampler provides superior collection of inhalable particles including bacteria and fungal spores. Use the Button Sampler with a 25-mm membrane filter such as MCE or PVC to collect bioaerosols for non-viable analysis. Using SKC gelatin filters with the Button Sampler increases the survival of stress-sensitive microorganisms during sampling for viable analysis. Using SKC polycarbonate filters with the Button Sampler is ideal for sampling multiple bioaerosols. The Button Sampler is used with a sample pump capable of 4 L/min for personal inhalable particulate sampling following the ISO 7708/CEN criteria.

Note: Gelatin filters dissolve when placed on agar.

Cleaning

Using mild soapy water, clean all parts of the Button Sampler before further sampling. The Button Sampler can be brushed and/or wiped with a clean dust-free tissue, air dried, blown dry, or wiped with isopropyl alcohol. Take particular care in cleaning the PTFE O-ring.

† The Button Sampler may also be autoclaved at up to 273.2 F (134 C). **Before autoclaving the sampler, remove the collar clip using a Phillips head screwdriver and remove the BUNA-N O-ring from the sampler body (SKC does not recommend autoclaving the BUNA-N O-ring).** See page 2 for exploded view of sampler. The Button Sampler Calibration Adapter can be autoclaved up to the temperature stated above.

References

Kalatoor, S., Grinshpun, S., Willeke, K., "New Aerosol Sampler with Low Wind Sensitivity and Good Filter Collection Uniformity," *Atmospheric Environment*, Vol. 29, No. 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*, Vol. 58, No. 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*, Vol. 61, May/June 2000, pp. 398-404

Wang, C., et al., "Field Evaluation of Personal Sampling Methods for Multiple Bioaerosols," March 23, 2015, doi.org/10.1371/journal.pone.0120308

Optional Accessories

Description	Cat. No.
Button Sampler , requires a 25-mm filter	225-360
Button Sampler Pump Kit includes Button Sampler, standard XR5000 Sample Pump, single charger with cable, 3 feet of Tygon tubing, and calibration adapter, requires a 25-mm filter	100-240 V 210-4121
Button Sampler Calibration Adapter	225-361
Filter Transport Case , for 25-mm filters, conductive plastic	225-67
Replacement O-ring , PTFE	P32265
Filters (25 mm)^Δ	
Glass fiber , 1.0 μm, pk/500	225-702
PTFE with PMP support ring , ^{∞**} 3.0 μm, pk/50	225-1711
Polyvinyl chloride (PVC) , 5.0 μm, pk/100	225-5-25
Mixed cellulose ester (MCE) , 1.2 μm, pk/100	225-1912
Gelatin , [#] sterilized, pk/50	225-9551
Polycarbonate , 0.8 μm, pk/100	225-1601

^Δ A pore size of 1.0 μm or larger is recommended for use with the Button Sampler due to back pressure limitations of personal samplers.

[∞] Back pressure on PTFE filters can vary within the same lot.

[#] Gelatin filters dissolve when placed on agar.

^{**} Maximum operating temperature is 464 F (240 C) based on the PMP support ring.

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