



## Operating Instructions

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### Button Aerosol Sampler Catalog No. 225-360

The patented\* 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 ( $< 100 \mu\text{m}$  aerodynamic diameter<sup>†</sup>) including bioaerosols for viable or non-viable analysis.



SKC Button Aerosol  
Sampler

While closely following the ACGIH/ISO 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 Method 7702). Fungal spore analysis includes microscopy, immunoassay, or polymerase chain reaction (PCR).

† Very large particles ( $> 100 \mu\text{m}$ ) 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 ACGIH/ISO 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)

**Tubing:** 1/4-inch ID

\* U.S. Patent Nos. 5,954,845 and 5,958,111

## Operation

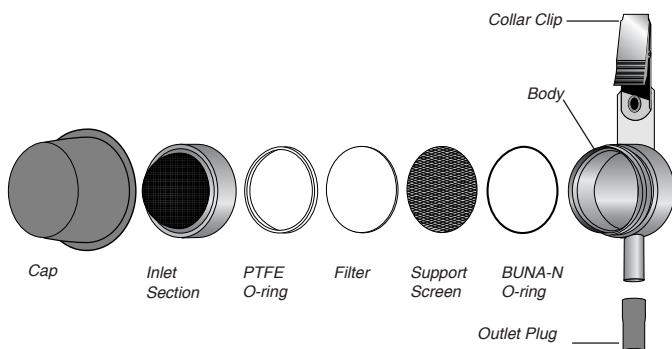
Wear gloves and use forceps when handling filters.

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.

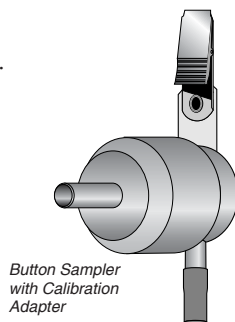
4. Place the PTFE O-ring on top of the filter.
5. Replace the inlet and **very gently** turn clockwise until moderately tight.

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



## Calibration

1. Ensure pump had run for 5 minutes before calibrating.
2. Using flexible tubing, connect the outlet of the Button Sampler to the inlet of a sampling pump.
3. Place the calibration adapter outlet onto the Button Sampler inlet, and connect the calibration adapter inlet to a primary standard 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 with a fresh conditioned and weighed filter for sample collection.



**Note:** If using the Button Sampler with protective shield for abrasive blasting sampling, calibrate the Button Sampler without shield using the Calibration Adapter. Following calibration, push shield onto sampler inlet and sample.

## 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 sampling pump such as an AirChek® XR5000 Sampler 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 as an Abrasive Blasting Sampler for Heavy Metals<sup>‡</sup>

SKC has designed a protective shield for the Button Sampler for use when sampling in abrasive blasting environments. The shield protects the filter from shredding or being overloaded by large particles thrust onto the sampler during blasting. Tested by the U.S. Military during recent abrasive blasting operations, the Button Sampler with protective shield (Abrasive Blasting Sampler for Heavy Metals) withstood very high particle concentrations and provided recoverable samples and meaningful exposure information. The shield is very easy to use, simply push it onto the sampler inlet and sample (*see Sampling*).

<sup>‡</sup> The Button Sampler with shield is **not** suitable for sampling silica. While silica is commonly found in abrasive blasting environments, sampling for silica using OSHA Method ID 142 requires a cyclone.

## Using the Button Sampler to collect Inhalable Bioaerosols

The patented 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 viable or non-viable analysis. Using SKC gelatin filters with the Button Sampler increases the survival of stress-sensitive microorganisms during sampling. The Button Sampler is used with a sample pump capable of 4 L/min for personal inhalable particulate sampling following the ACGIH/ISO 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 up to approximately 273.2 F (134 C). Prepare the Button Sampler before autoclaving by removing the collar clip from the sampler using a Phillips head screwdriver. Also remove the BUNA-N O-ring from the sampler body (*see page 2 for exploded view of sampler*).

## 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., England, A., Grinshpun, S., Willeke, K., Carlton, G., "Metal Exposures Among Abrasive Blasting Workers at Four U.S. Air Force Facilities," *Applied Occupational and Environmental Hygiene*, Vol. 15, No. 10 (2000), pp. 766-772

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

## Optional Accessories

Description	Cat. No.
<b>Button Sampler</b> , requires a 25-mm filter	<b>225-360</b>
<b>Button Sampler Pump Kit</b> 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	<b>210-4121</b>
<b>Abrasive Blasting Kit</b> includes Button Sampler and protective shield, requires a 25-mm filter	<b>225-367</b>
<b>Button Sampler Calibration Adapter</b>	<b>225-361</b>
<b>Protective Shield</b> , for abrasive blasting environments	<b>225-366</b>
<b>Filter Transport Case</b> , for 25-mm filters, conductive plastic	<b>225-67</b>
<b>Replacement O-ring</b> , PTFE	<b>P32265</b>

Filters (25 mm) <sup>Δ</sup>	Cat. No.
<b>Glass fiber</b> , 1.0 μm, pk/500	<b>225-702</b>
<b>PTFE with PMP support (Teflo®)</b> , ∞ <sup>**</sup> 3.0 μm, pk/50	<b>225-1711</b>
<b>Polyvinyl chloride (PVC)</b> , 5.0 μm, pk/100	<b>225-5-25</b>
<b>Mixed cellulose ester (MCE)</b> , 1.2 μm, pk/100	<b>225-1912</b>
<b>Gelatin</b> , <sup>#</sup> sterilized, pk/50	<b>225-9551</b>

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 for the Cat. No. 225-1711 PTFE filter with PMP support is 464 F (240 C) based on the PMP support ring.

## SKC Limited Warranty and Return Policy

SKC products are subject to the SKC Limited Warranty and Return Policy, which provides SKC's sole liability and the buyer's exclusive remedy. To view the complete SKC Limited Warranty and Return Policy, go to <http://www.skccinc.com/warranty.asp>.

Form 3780 Rev 1502