Operating Instructions

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Aluminum Cyclone
25 mm – Catalog No. 225-01-01
37 mm – Catalog No. 225-01-02

The SKC Aluminum Cyclone

The SKC Aluminum Cyclone is a lightweight respirable dust sampler that is used with a filter loaded into a three-piece filter cassette. The cyclone separates the dust particles according to size. The respirable particles collect on a filter for analysis while larger particles fall into the grit pot and are discarded.

The SKC Aluminum Cyclone is available in two sizes: 25 mm for use with 25 mm three-piece cassettes and 37 mm for use with 37 mm three-piece cassettes. The filter material, pore size, and the support pad must be selected as specified by the sampling method used.

Flow rate: 2.5 L/min for ACGIH/ISO/CEN Convention (nominal D=4.0 μm)*
1.9 L/min for BMRC Convention (nominal D=5.0 μm)

** As previously published, a flow rate of 2.6 L/min will give a 4 μm cut-point, however, 2.5 L/min will give a better match over the entire curve.*

Note: The ACGIH/ISO/CEN Curve (Soderholm) Convention requires using the flow rate that minimizes the bias of the cyclone separation from the convention curve.

Operation

Assembly

1. Disassemble the 3-piece cassette and set aside the inlet section, which is clearly marked "inlet." Remove the plug from the cassette outlet.

2. Select a filter and support pad as specified in the sampling method. It is not necessary to weigh the filter for calibration. For sample collection, weigh the filter (not the filter cassette) and record the weight as the pre-sample weight. Place the support pad into the cassette outlet and place the filter on top of the support pad (see Figure 1). Insert the cassette ring (middle) section into the cassette outlet (see Figure 1).

3. Insert the cyclone into the cassette ring and press firmly.

4. Insert the cyclone/cassette assembly through the large opening of the filter cassette holder (see Figure 3). Ensure the assembly is seated firmly in the holder by inserting the cyclone's side pin (the small round nodule on the rim of the cyclone) into the notch in the filter cassette holder.

5. Secure the assembly in the holder by stretching the spring-loaded hold-down plate over the cassette. Insert the adapter (located in the end of the rubber tubing) into the cassette outlet.

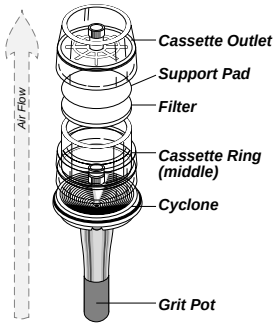

Figure 1
Exploded view of the cyclone/filter cassette assembly

Calibration

1. Prepare a cyclone/filter cassette assembly (see Assembly).
Note: *Calibrate the cyclone with grit pot in place.*

2. Moisten the O-ring inside the large end of the calibration chamber (Cat. No. 225-01-03, Figure 2) and push the chamber over the cyclone stem until it fits snugly.

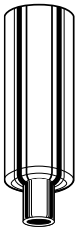

Figure 2
Calibration Chamber

3. Connect the Tygon® tubing attached to the filter cassette holder to the inlet of a constant flow personal sampling pump. Using flexible tubing, connect the calibration chamber to a primary standard calibrator.

4. Following the instructions in the pump and calibrator manuals, calibrate the required flow rate. Figure 1 - Constant Pressure Controller

5. Disconnect the calibrator and replace the filter used to set the flow with a fresh weighed filter for sample collection.

Sampling

1. Ensure the flow rate has been calibrated (see Calibration).

2. Connect the Tygon tubing attached to the filter cassette holder to the inlet of a constant flow personal sampling pump, such as a Universal XR Series Sampler.

3. Clip the cyclone/filter cassette assembly onto a worker's collar or pocket as close to the breathing zone as possible.

4. 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.

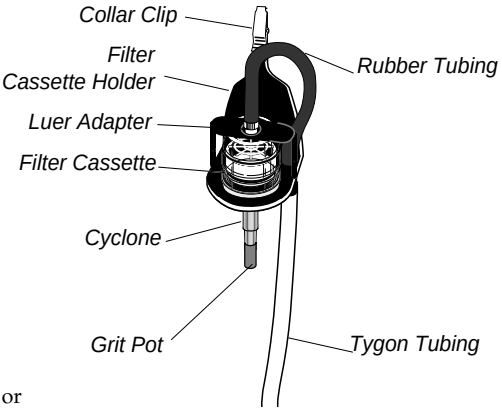

Figure 3
Cyclone with filter cassette in holder

5. At the end of the sampling period, stop the pump and record the finish time. Remove the cyclone/filter cassette assembly from the cassette holder. Separate the cyclone from the cassette. **Note:** Particles collected in the grit pot do not represent any part of the respirable dust sample and should be discarded. Reassemble the inlet section of the cassette, ensuring the inlet and outlet are sealed with plugs. Send the cassette and all data to a laboratory for analysis.

6. Prior to further sampling, clean all parts of the cyclone, including the interior of the grit pot, with mild soapy water. The cyclone may be wiped with a clean dust-free tissue, air dried, blown dry, or wiped with isopropyl alcohol.

Accessories		Catalog No.
Three-piece Filter Cassette Blanks	25 mm	225-3-25
	37 mm	225-3
Filter Cassette Holder	25 or 37 mm	225-1
Calibration Chamber	25 or 37 mm	225-01-03

Reference:

Harper, M., Fang, C.P., Bartley, D.L., Cohen, B.S., "Calibration of the SKC, Inc Aluminum Cyclone for Operation in Accordance with ISO/CEN/ACGIH Respirable Aerosol Sampling Criteria," *J. Aerosol Sci.*, Vol. 29, Suppl. 1, Elsevier Science Ltd., Great Britain, 1998, pp. S347-S348.