Operating Instructions

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DPM Cassette with Impactor
Cat. No. 225-317

SKC Diesel Particulate Matter Cassettes are designed for sampling in atmospheres where it is necessary to separate DPM, carbon nanotubes (CNTs), and carbon nanofibers (CNFs) from other respirable dust (such as coal dust). Single-use disposable SKC DPM Cassettes are tamper-evident sealed to ensure sample integrity. Each streamlined plastic cassette comprises an impactor with precision sapphire orifice, impaction substrate, and two heat-treated, binder-free quartz filters. The impactor screens out respirable particles ≥ 1.0 µm. Particles less than 1.0 µm are collected on the first filter, and the second filter serves as a dynamic blank for correction of absorbed organic carbon. Samples are analyzed for organic and elemental carbon content of DPM per NIOSH Method 5040 or for CNTs and CNFs; *see NIOSH CIB 65.*

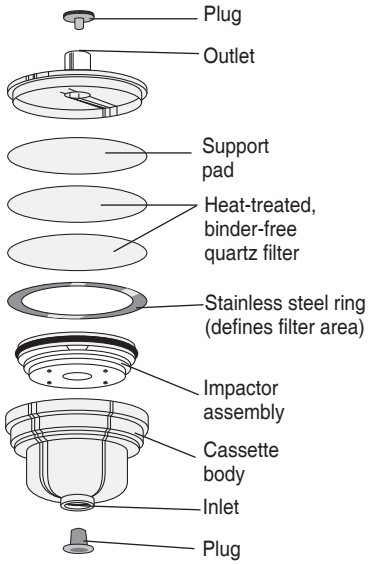

Figure 1. Exploded view of DPM Cassette (Cat. No. 225-317)

Performance Profile

Cassette Size:	37 mm
Filter:	Two heat-treated, binder-free quartz fiber with cellulose support pad
Filter Collection Area:	8.04 cm^2
Impactor:	Four-nozzle, precision sapphire orifices
Flow Rate:	Calibrated at 1.7 and 2 L/min for sampling of submicron particles
Analysis:	For organic and elemental carbon using evolved gas analysis (EGA) with thermal-optical analyzer (NIOSH 5040) and electron microscopy (NIOSH CIB 65)

Sampling Equipment

The SKC DPM Cassette is designed for use with an appropriate sample pump and cyclone that pre-selects non-respirable particles.* An SKC Universal XR or AirChek® Series sample pump can provide the specified flow rate. Use SKC Cassette/Cyclone Holder Cat. No. 225-1 to secure the cassette when used with the GS-1 Cyclone.

* *A cyclone is not necessary in all sampling situations. It should be used in settings where larger particulate is likely to clog the impactor.*

Setting Up the Sampling Train with Cyclone and Holder

1. Insert stem of GS-1 Cyclone into large hole in cassette holder.

2. Orient cyclone in holder until the small round nodule on the bowl adapter rim fits into the notch in the cassette holder.

3. Remove inlet and outlet plugs from a DPM Cassette, pull back spring-loaded hold-down plate on cassette holder, and gently push inlet of cassette onto top of cyclone.

4. Position small hole in hold-down plate over cassette outlet.

5. Insert Luer adapter on the holder's rubber tubing into cassette outlet.

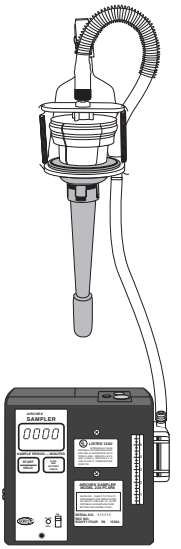

Figure 2. DPM Sampling Train with GS-1 Cyclone, Cassette Holder, and Universal PCXR4 Pump

Setting Up the Sampling Train Without a Cyclone

1. Remove the plug from the outlet of the cassette *(Figure 1)*.

2. Attach one end of a length of Tygon® tubing to the cassette outlet and the other end to the inlet of an air sample pump capable of maintaining the desired flow rate.

3. Secure the cassette on a worker by using a cable tie and collar clip.

4. Remove plug from the cassette inlet immediately before sampling.

Calibration

1. Prepare a DPM Cassette or cyclone/DPM Cassette assembly. **If using a cyclone, ensure grit pot remains on cyclone body during calibration.**

SKC recommends using the smallest calibration jar possible. To achieve this, do NOT use Cassette Holder Cat. No. 225-1 during calibration.

2. Place DPM Cassette or cyclone/DPM Cassette assembly into an airtight calibration jar Cat. No. 225-111 that contains an inlet and outlet *(Figure 3)*.

3. Using flexible tubing, connect calibrator outlet to inlet of calibration jar.

Figure 3. Calibration Train with Jar

4. Run tubing from outlet of DPM Cassette or cyclone/DPM Cassette assembly through outlet of calibration jar and to the inlet of a sample pump. If using the SKC Cat. No. 225-111 jar, connect the Luer adapter inside the jar to the cyclone/cassette outlet. Connect jar outlet to inlet of a sample pump.

5. Turn on pump and calibrate to desired flow rate following directions in the pump and calibrator operating instructions.

6. After calibration, disassemble calibration jar, remove the DPM Cassette or cyclone/DPM Cassette assembly, and replace DPM Cassette used for calibration with a fresh (unused) cassette to be used for sampling.

Sampling

1. Ensure pump is calibrated to the appropriate flow rate. *See Calibration*.

2. Turn on pump and sample for the appropriate time.

3. When sampling is completed, turn off the pump, remove the DPM Cassette or cyclone/DPM Cassette assembly from the holder, remove the cassette from the cyclone, and immediately plug both the inlet and outlet of the cassette with the provided plugs.

Shipping
Package the cassettes for shipment to a laboratory for analysis.

Analysis
Total carbon represents more than 80% of DPM particulate emissions. NIOSH 5040 can be used to quantitatively determine the total carbon (organic and elemental) content of the sample.

Ordering Information

Description	Cat. No.
SKC DPM Cassette with Impactor contains two 37-mm heat-treated, binder-free quartz filters, tamper-evident sealed, single use,† meets NIOSH 5040 specifications, average sampler deposition area is 8.04 cm^2, pk/10 *Limited shelf-life*	**225-317**
SKC GS-1 Cyclone,* single inlet, 10 mm, conductive plastic	**225-105**
Filter Cassette/Cyclone Holder, for attaching a DPM or standard filter cassette to a worker's clothing in the breathing zone. May be used with or without a cyclone, *required when using DPM Cassette with GS-1 Cyclone*	**225-1**
Tubing, Collar Clip, and Cable Tie includes 3 feet of Tygon tubing (1/4-inch ID) and alligator clip attached to a nylon cable tie	**225-13-8**
Multi-purpose Calibration Jar	**225-111**

* *A cyclone should be used in settings where larger particulate is likely to clog the impactor.*
† *Requires 1/4-inch tubing for filter cassette/cyclone holder*

SKC also offers DPM cassettes without impactors. For more information, see www.skcinc.com/prod/225-317.asp.

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.skcinc.com/warranty.