



SKC 225-384 User-loaded Disposable Parallel Particle Impactors Instruction Manual

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**225-384 User-loaded Disposable Parallel Particle Impactors
Instruction Manual**
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SKC User-loaded Disposable Parallel Particle Impactors (PPI)



The patented† impaction-based SKC Disposable Parallel Particle Impactor (PPI®) Samplers are designed to match precisely the collection efficiency curves for respirable and thoracic dust specified by ISO 7708/CEN and adopted by ACGIH, CEN, and other occupational hygiene organizations. Performance data of the PPI Samplers relative to the ISO 7708/CEN criteria was published in the Journal of Physics, Conference Series 151, 2009, and the data were made part of the OSHA Docket used to develop the OSHA final silica rule (final rule page 16439). The thoracic model meets the requirements of compounds with ACGIH® thoracic TLV®s. Disposable PPI

Samplers offer the convenience of single-use to eliminate sampler assembly and cleaning; small size for worker comfort, even under helmets or other PPE; and a choice of flow rates for maximum flexibility in pump options, sample duration, and contaminant concentration. **These instructions are for PPI models that are NOT preloaded with filters and supports; these models contain only impaction substrates.**

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Performance Profile

Sampling Rate: 2 L/min respirable or thoracic and 4 or 8 L/min respirable

Sample Pump:

- Universal or AirChek® Series for 2 and 4 L/min
- Leland Legacy for 8 L/min

Sample Time: Dependent on the method used. **Note:** SKC tests indicate that a particulate mass of up to 6.8 mg on the four impaction substrates would not affect PPI performance. This amount is equivalent to sampling for 6 hours at 4 L/min in environments where respirable mass concentration is 4.76 mg/tit' and equals 50% of total dust. However, labs have reported to SKC that they prefer no more than 2 mg on the filter for analytical reasons. Therefore, SKC recommends that you work with your lab to determine optimum sample times for your unique sampling conditions.

Sample Media 37-mm, 5.0- μ m PVC filter or 37-mm, 0.8- μ m MCE filter
(recommended):

Impaction Substrate: Use cellulose or stainless steel screen for support Four 3/8-in diameter pre-oiled porous plastic discs (assembled in all Disposable PPIs)

Analysis: Gravimetric and/or chemical

Body Material: Conductive ABS plastic

Dimensions:

Height: 4.25 in (10.8 cm) – clip to exhaust

Diameter: 1.8 in (4.6 cm)

Depth: 1.2 in (3 cm)

Weight: 1.1 oz (31.2 gm)

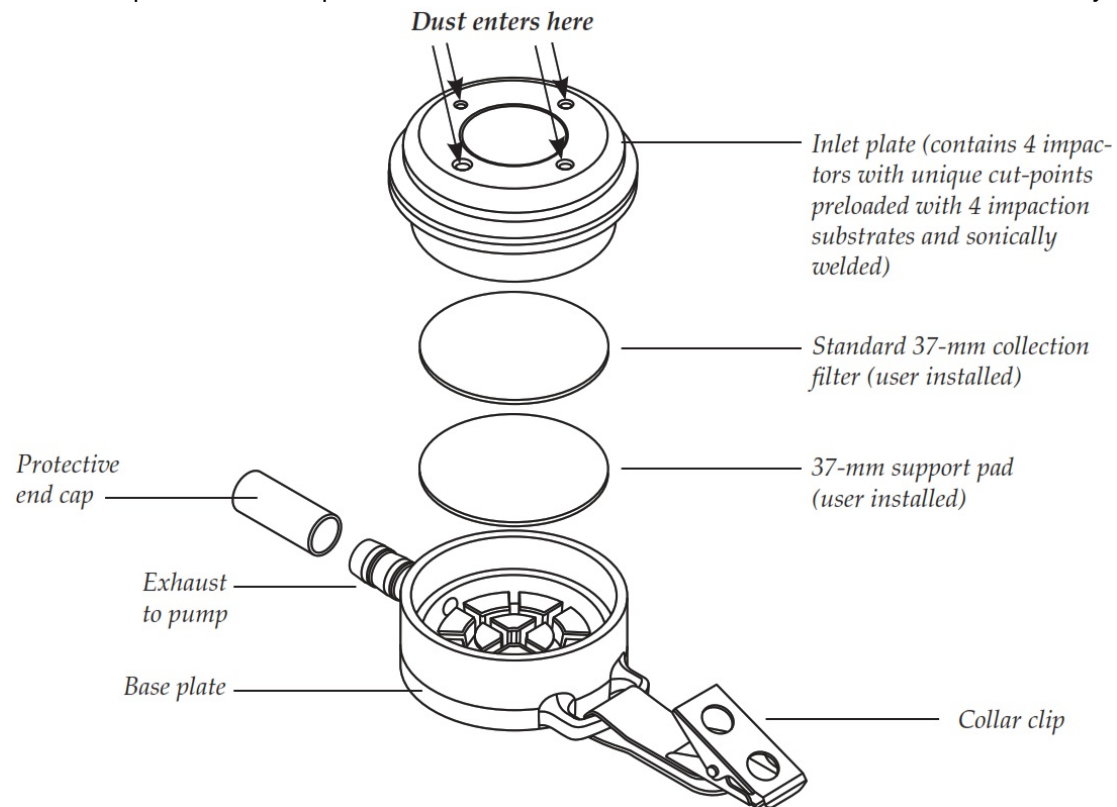
Shelf-life: 18 mos from date of manufacture

† U.S. Patent No. 7,073,402

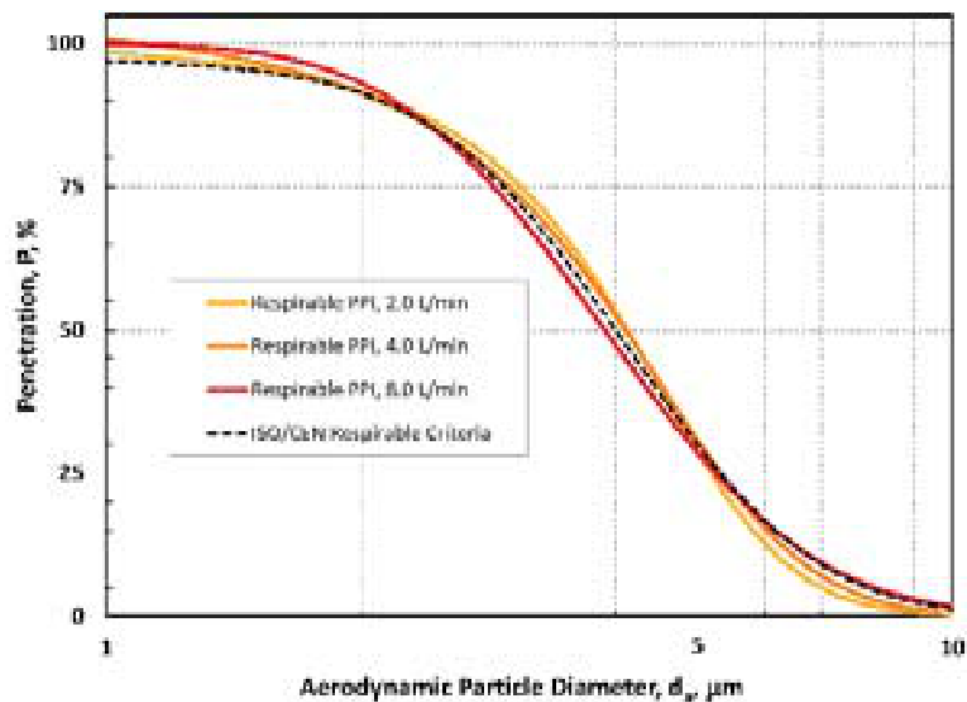
Principle of Operation

SKC Disposable PPI Samplers are impaction-based filter samplers that perform precise size-selection for either thoracic or respirable dust, depending on the model. PPI Samplers contain four small impactors in the inlet section of the device. Each impactor features a unique 50% cut-point to target a specific one-quarter segment of the ISO/CEN curve resulting in a precise fit along the entire curve. A sample pump operating at 2, 4, or 8 L/min (2 L/min only for thoracic) pulls air through the inlet nozzle of each impactor in the inlet plate. Particles larger than

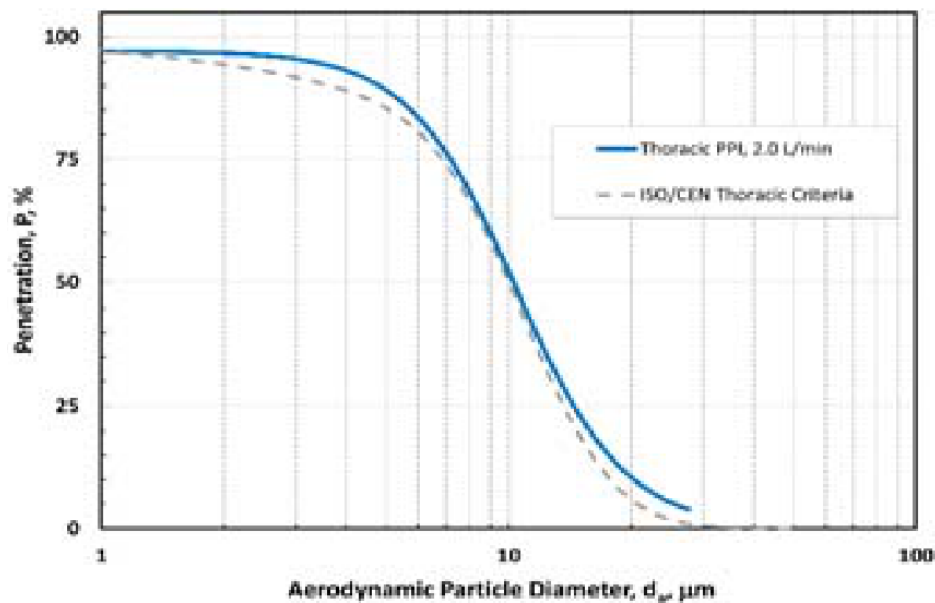
each impactor's 50% cut-point are scrubbed and retained by impaction onto the porous oiled impaction substrate contained in each impactor. Smaller particles continue to the standard 37-mm collection filter for analysis.



PPI Performance



Collection efficiency of the 2, 4, and 8 L/min respirable PPI Samplers compared to the ISO respirable curve



Collection efficiency of the 2 L/min thoracic PPI Sampler compared to the ISO thoracic convention

Media and Sampler Preparation

Media Preparation

Condition and weigh filters according to the method used. Record the weight as the pre-sample weight.

Sampler Preparation

The PPI will arrive with the inlet plate shrink-wrapped and the base plate separated.

1. Remove the shrink wrap from the inlet plate.



2. Using forceps, insert first a 37-mm support pad and then a conditioned and weighed 37-mm collection filter (if using gravimetric analysis) into the base plate.



3. Lay the base plate on a flat surface, align the inlet plate with the base, and press down firmly to achieve an even seal.



4. Write sample ID on sampling label. Adhere the sampling label to the bottom of the base plate.



5. Remove the protective end cap from the exhaust.

Technical Tidbits:

- Use forceps to carefully insert or remove the collection filter and support pad. See Accessories for forceps.

Calibration and Sampling

Tip: As the particle load on the filter increases during sampling, the pressure drop will also increase. Therefore, use a compensating sample pump such as the AirChek Series or Leland Legacy depending on flow rate requirements.

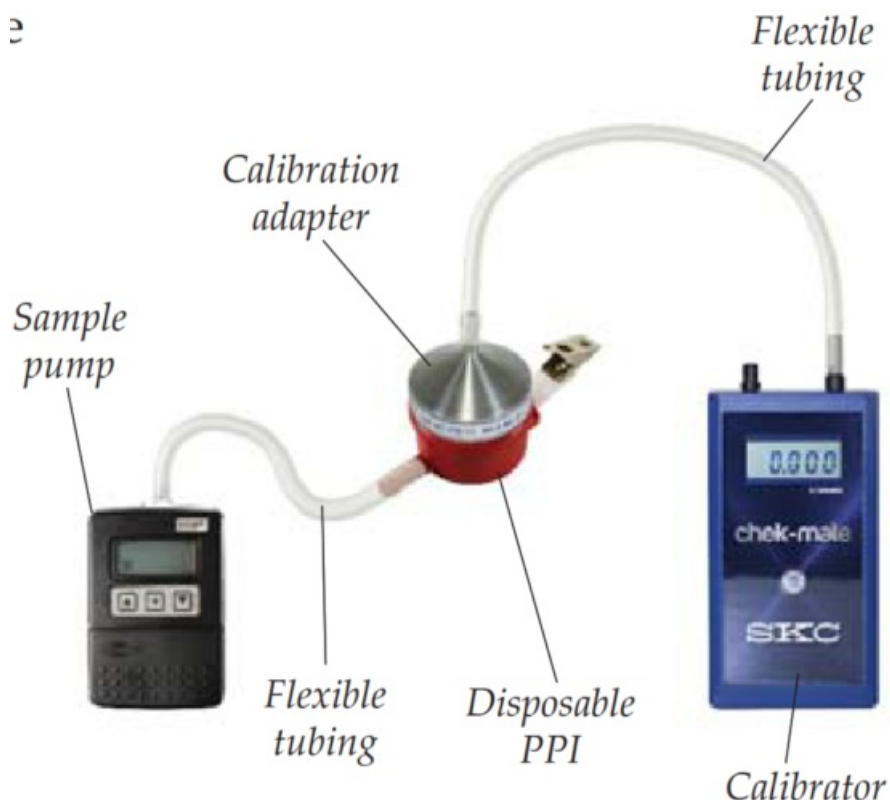
Calibration

Calibrate pump flow rate with a representative Disposable PPI (support and filter loaded) in line. **Note:** If using SKC High Flow chek-mate Calibrator, Pulsation Dampener Cat. No. 375-150 is also required in line. **See pump and calibrator operating instructions.**

1. Ensure the pump has run for 5 minutes before calibrating.
2. Ensure the representative impactor is loaded with a support and collection filter and that it is fully assembled.
See Sampler Preparation on page 3.
3. Align the bottom of the calibration adapter with the inlet plate of an assembled, loaded representative Disposable PPI and press down firmly until the calibration adapter's O-ring is engaged and creates an even seal.
4. Use flexible tubing to connect the exhaust of the Disposable PPI to the inlet of a sample pump.
5. Use flexible tubing to connect the inlet of the calibration adapter to the suction port (outlet) of a calibrator.
6. Calibrate to 2 L/min for the 2 L/min respirable and thoracic model PPIs, 4 L/min for the 4 L/min respirable model, or 8 L/min for the 8 L/min respirable model. Follow the calibration instructions in the pump and calibrator operating instructions.
7. When calibration is completed, disconnect the tubing from the calibrator and calibration adapter.
8. Grasp the Disposable PPI with one hand and the calibration adapter with the other hand. Firmly pull/twist to remove the calibration adapter from the Disposable PPI inlet plate.
9. Replace the representative Disposable PPI used to set the flow with a new loaded Disposable PPI for sample collection.



Using excessive pressure to seal the calibration adapter to the Disposable PPI may make the calibration adapter difficult to remove.



Sampling

SKC tests indicate that a particulate mass of up to 6.8 mg on the four impaction substrates would not affect PPI performance. This amount is equivalent to sampling for 6 hours at 4 L/min in environments where respirable mass concentration is 4.76 mg/m³ and equals 50% of total dust. However, labs have reported to SKC that they prefer no more than 2 mg on the filter for analytical reasons. Therefore, SKC recommends that you work with your lab to determine optimum sample times for your unique sampling conditions.

1. As per good industrial hygiene practice, replace the representative sampler used for calibration with a new, unused loaded sampler. See Media and Sampler Preparation.
2. Record sample starts time on the label.
3. Clip Disposable PPI onto a worker's collar or lapel in the breathing zone or in the area to be sampled.



4. Clip sample pump at the worker's waist or close to the Disposable PPI.
5. Use flexible tubing to attach the Disposable PPI exhaust to the inlet of the sample pump.

6. Turn on the pump and record pertinent sample data.
7. After the desired sample time has elapsed, turn off the pump and unclip the sampler from the sampling location.
8. Apply a Post-use label to the inlet plate to seal the sampler.



9. Record sample stops time on a label on the bottom of the sampler.
10. Disconnect the sampler from the pump and reinstall 10 protective end caps on the exhaust.



11. Reinstall calibration train with representative Disposable PPI and verify flow rate. See Calibration.

Sample Transport and Analysis

Package and transport samples and blanks to an accredited laboratory for gravimetric or chemical analysis.

References

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Ordering Information

User-loaded Disposable Plastic PPI Samplers , select the PPI for the desired convention. Designed for one-time use.	Cat. No
User-loaded Disposable PPI Samplers contain four porous disc impaction substrates. Require collection on filter and support; see information below and select based on application	225-384
Respirable PPI (red) , 8 L/min, plastic	225-387
Respirable PPI (orange) , 4 L/min, plastic	225-385
Respirable PPI (gold) , 2 L/min, plastic	225-386
Thoracic PPI (blue) , 2 L/min, plastic	
Recommended Collection Filters for User-loaded Disposable PPI , required for sampling. Select a filter based on your application.	
PVC Filters , 37 mm, 5.0-µm pore size, pk/100	225-5-37
MCE Filters , 37 mm, 0.8-µm pore size, pk/100	225-1939
Filter Supports are required for User-loaded Disposable PPI sampling. Select either cellulose or stainless steel.	
Support Pads , cellulose, 37 mm, pk/100	225-27
Support Pads , stainless steel, 37 mm, wide mesh, ea	225-26
Accessories	
Calibration Adapter for Disposable PPI	225-389
Forceps , stainless steel, non-serrated fl at tips	225-8371

* Backpressure on PTFE filters can vary within the same lot.

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 skcinc.com/warranty.

Documents / Resources

