Parallel Particle Impactors

Sampling Options for Thoracic or Respirable PM

- **Collection efficiency precisely matches PM criteria**
- **Models for use with a sample pump at 2 L/min or 8 L/min**
- **Economical and reusable**
  - Use any suitable 37-mm filter
- **Disposable pre-oiled impaction substrates reduce particle bounce and buildup effects on sampling accuracy**
  - Sampling efficiency is not dependent on collected particle type
- **Only 3.3 ounces (94 grams) — ideal for personal or area sampling**
- **Thoracic model with 10-µm cut-point is ideal for NIOSH Method 5524 and compounds with ACGIH® thoracic TLV®s**
- **Respirable models with 4-µm cut-point available in 2 L/min or 8 L/min**

The PPI 4-in-1 Advantage

Only the patented* SKC Parallel Particle Impactor (PPI) has the power of 4 impactors in 1 small sampler to provide the closest match to the ACGIH/ISO/CEN thoracic or respirable conventions. A job no single personal impactor can do alone!

Reduce Particle Buildup/Bounce Effects

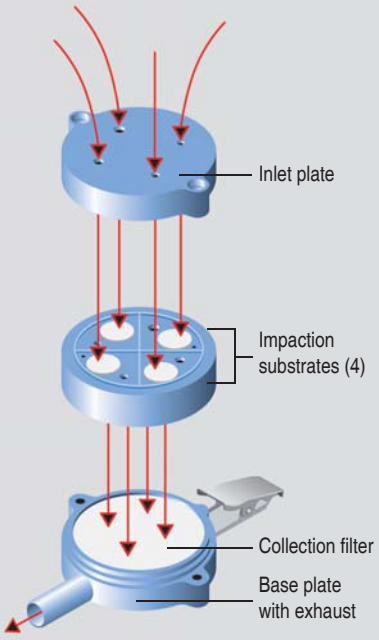
Disposable pre-oiled porous plastic impaction substrates reduce the negative effects particle buildup and bounce can have on sampling accuracy by firmly trapping larger particles. Unlike other samplers, SKC PPI sampling efficiency is not dependent on the type of particle collected.

See PPI Performance on page 2.

PPI — How it works

- The PPI contains four impactors arranged in parallel, each with a different 50% cut-point that targets a specific segment of the selected convention.
- A personal sample pump provides a 2 L/min flow to operate each impactor simultaneously, but independently.
- The sample collects on a single 37-mm filter and is analyzed gravimetrically to provide a thoracic or respirable result that is closer to the entire range of the selected convention than any other sampler available.

PPI models are available for thoracic sampling at 2 L/min and respirable sampling at 2 L/min or 8 L/min.



* *U.S. Patent No. 7,073,402*

SKC

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Parallel Particle Impactor

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SKC PPI Performance[1]

The Parallel Particle Impactor models were evaluated in a test chamber by measuring aerosol concentration upstream and downstream of the sampler using an Aerodynamic Particle Sizer. Potassium sodium tartrate (PST), dioctyl phthalate (DP), glass spheres (GS), and coal mine dust were used as test aerosol. Performance of the PPIs and other available size-selective samplers were compared.

Data in Figures 1 and 2 indicate performance of the 2 and 8 L/min Respirable PPIs and Thoracic PPI are in agreement with their respective ACGIH/CEN/ISO conventions. Experiments revealed that a load of approximately 6.4 mg of coal mine dust on the sampler substrates (impaction plates) did not adversely affect performance of the PPIs.

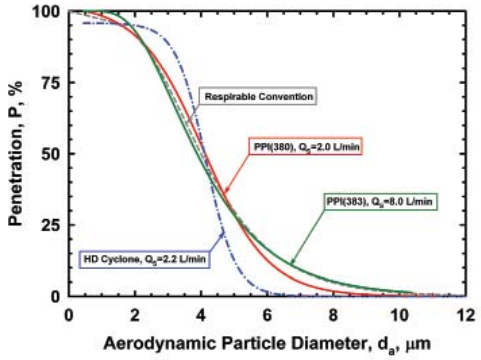

Figure 1. *Comparison of penetration characteristics measured for the 2 and 8 L/min respirable PPI Samplers and Higgins-Dewell Cyclone using PST test particles*

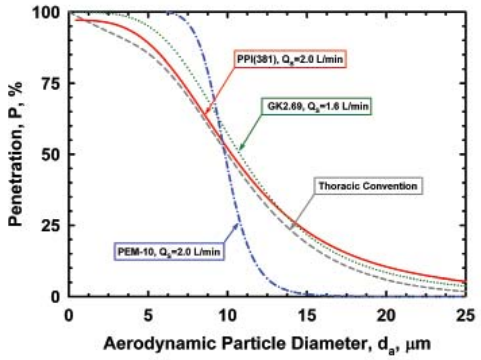

Figure 2. *Comparison of penetration characteristics measured for the thoracic PPI Sampler, PEM 10 Sampler, and GK2.69 Cyclone using PST test particles*

References

[1] *Trakumas, S., Hall, P., Personal Respirable Sampler Containing Four Impactors Arranged in Parallel, Abstracts of 23rd Annual AAAR Conference, Atlanta, GA, 2004, p. 78*

Trakumas, S., Salter, E., "Parallel Particle Impactor - Novel Size-selective Particle Sampler for Accurate Fractioning of Inhalable Particles," Journal of Physics: Conference Series 151 (2009), 16 pp., 012060, www.skcinc.com/instructions/Parallel Particle Impactor Paper.pdf

Trakumas, S., "High-flow Personal Respirable Dust Sampler for Increased Sensitivity," Poster 261, AIHce 2010, Denver, CO

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Performance Profile

Sampling Rate: 2 L/min respirable or thoracic or 8 L/min respirable
Sample Pump: Universal or AirChek® for 2 L/min, Leland Legacy for 8 L/min
Sample Time: Dependent on method used
Sample Media: 37-mm, 5.0-µm PVC filter or 37-mm, 2.0-µm PTFE filter† (NIOSH 5524) or 37-mm, 0.8-µm MCE filter
Use cellulose pad or stainless steel screen for support.
Tubing: 1/4-inch ID
Impaction Substrate: Four $^3/_8$-in diameter pre-oiled porous plastic discs
Analysis: Gravimetric or other
Body Material: Conductive aluminum
Dimensions: Height (clip to exhaust): 3.74 in (9.4 cm)
Diameter: 1.7 in (4.3 cm)
Depth: 1.1 in (2.8 cm)
Weight: 3.3 oz (94 gm)

Ordering Information

Each PPI sample requires:

- 1 filter
- 1 support
- 4 impaction substrates

All items are available separately.

PPI Samplers	Cat. No.
Thoracic PPI (blue), 2 L/min, aluminum	**225-381**
Respirable PPI (black), 2 L/min, aluminum	**225-380**
Respirable PPI (red), 8 L/min, aluminum	**225-383**

Recommended Collection Filters for PPI, *required for sampling*	
PVC Filters, 37 mm, 5.0 µm, pk/50	**225-8-01-1**
PTFE Filters†, 37 mm, 2.0 µm, with support pad, for metalworking fluids, NIOSH 5524, pk/50	**225-27-07**
MCE Filters, 37 mm, 0.8 µm, with support pad, pk/100	**225-5**

Filter Supports, *required for sampling* *Select either cellulose or stainless steel*	
Support Pads, cellulose, 37 mm, pk/100	**225-27**
Stainless Steel Support Screen, 37 mm, wide mesh	**225-26**

Impaction Substrates, *4 required for each sample*	
Porous Plastic Discs, $^3/_8$-inch diameter, pre-oiled, ready to use, disposable, pk/200, *limited shelf-life*	**225-388**

Accessories	
Multi-purpose Calibration Jar	**225-111**
Forceps, stainless steel	**225-8371**
Filter-Keeper™, for transport and storage of 37-mm filters, pk/10	**225-8303A**

† *Back pressure 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 http://www.skcinc.com/warranty.asp.

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