

Parallel Particle Impactors

A New Sampling Option for Thoracic PM

- Collection efficiency precisely matches PM criteria
- Use with a sample pump at 2 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- μ m cut-point is ideal for NIOSH Method 5524 and compounds with ACGIH® Thoracic TLV®s
- Respirable model with 4- μ m cut-point also available



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

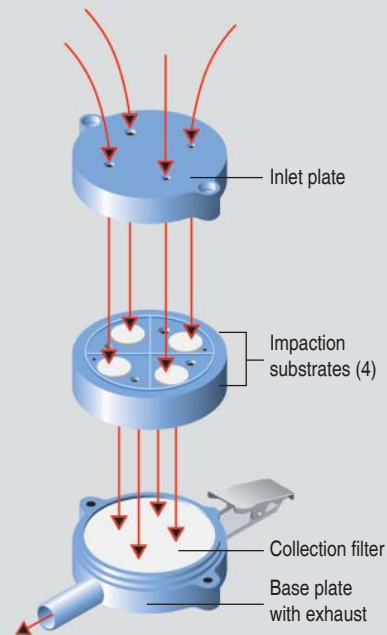
Disposable pre-oiled porous plastic impaction substrates reduce the negative effects particle buildup and bounce can have on sampling accuracy by firmly trapping larger particles. Unlike other samplers, SKC PPI sampling efficiency is not dependent on the type of particle collected.

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 or respirable sampling at 2 L/min.



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



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SKC PPI Performance¹

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 Respirable PPI 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.

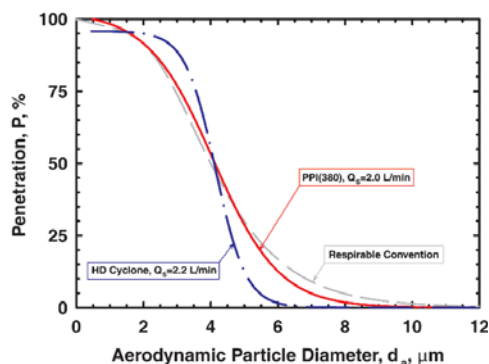


Figure 1. Comparison of penetration characteristics measured for the respirable PPI Sampler and Higgins-Dewell Cyclone using PST test particles

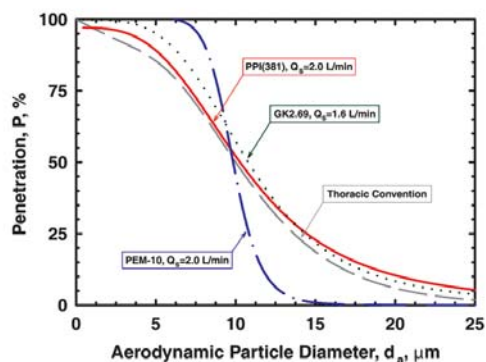


Figure 2. Comparison of penetration characteristics measured for the thoracic PPI Sampler, PEM 10 Sampler, and GK2.69 Cyclone using PST test particles

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

² 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](http://www.skcinc.com/instructions/Parallel%20Particle%20Impactor%20Paper.pdf)

Performance Profile

Sampling Rate: 2 L/min
Sample Pump: Universal or AirChek®
Sample Time: Dependent on method used
Sample Media: 37-mm, 5.0- μ m PVC filter or 37-mm, 2.0- μ m PTFE filter† (NIOSH 5524) or 37-mm, 0.8- μ m MCE filter
 Use cellulose pad or stainless steel screen for support.

Impaction

Substrate: Four $\frac{3}{8}$ -in diameter pre-oiled porous plastic disks
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, 2 L/min, aluminum	225-381
Respirable PPI, 2 L/min, aluminum	225-380

Recommended Collection Filters for PPI, required for sampling	
PVC Filters, 37 mm, 5.0 μ m, pk/50	225-8-01-1
PTFE Filters†, 37 mm, 2.0 μ m, with support pad, for metalworking fluids, NIOSH 5524, pk/50	225-27-07
MCE Filters, 37 mm, 0.8 μ m, 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 Screen, 37 mm, wide mesh	225-26

Impaction Substrates, 4 required for each sample	
Porous Plastic Disks, $\frac{3}{8}$ -in diameter, pre-oiled, ready to use, disposable, pk/200, limited shelf-life	225-388

Accessories	
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 (Teflon) filters can vary within the same lot.

