

Reusable Parallel Particle Impactors (PPIs)

A Precise Match to ISO Respirable and Thoracic Dust Criteria

- **Collection efficiency precisely matches ISO/CEN 7708:1995 size-selection criteria**
 - Respirable PPI Samplers meet specifications in the 2013 OSHA NPRM for silica
- **Economical and reusable – use with any suitable 37-mm filter**
- **Load with disposable pre-oiled impaction substrates**
 - Reduce particle bounce and buildup effects
- **Only 3.3 ounces (93.6 grams) – ideal for both personal and area sampling**
- **Selection of flow rates available to meet specific applications**
 - **8 L/min respirable PPI:** Enhances sensitivity (for short-term and/or low concentration sampling) using high flow pumps; ideal for proposed lower OSHA PEL for silica
 - **4 L/min respirable PPI:** Provides higher flow option and use of intrinsically safe personal pump
 - **2 L/min respirable PPI:** Standard TWA sampling
 - **2 L/min thoracic PPI:** Metalworking fluids (NIOSH Method 5524) and thoracic TLV-TWA compounds such as sulfuric acid and cotton dust
- **Disposable plastic PPIs are available (see www.skcinc.com/prod/225-3841.asp)**



SKC Parallel Particle Impactor (PPI) Samplers are similar to traditional 37-mm filter cassettes in that they collect respirable dust on a standard 37-mm filter. That's where the similarity ends! Impaction-based PPI Samplers are designed to provide a precise match to the new criteria for respirable samplers, and *they do it in a unique way* (see *How PPI Works on page 2*).

Respirable PPI Samplers Meet Requirements in OSHA NPRM for Silica

In 2013, U.S. OSHA published a Notice for Proposed Rule Making (NPRM) for respirable crystalline silica. In the proposed rule, the PEL for all forms of silica would be lowered to 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) across all industries. In addition, OSHA has issued new criteria for respirable dust samplers which specifies that samplers meet the performance characteristics in ISO 7708:1995. The ISO standard contains a collection efficiency curve for respirable dust samplers with a 50% cut-point of 4 μm . This curve has been adopted by NIOSH, ACGIH, and many other global occupational hygiene organizations; SKC respirable PPI Samplers provide a precise match to this curve.

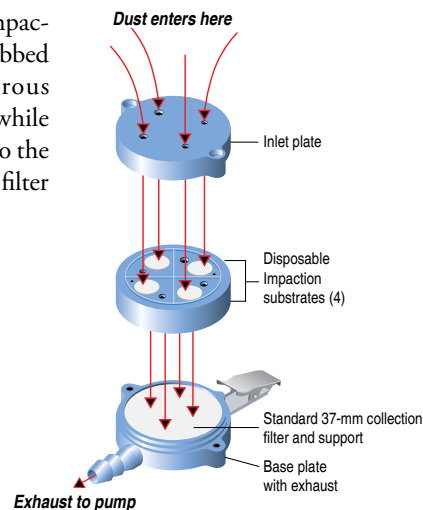
How PPI Works

Only the patented* SKC Parallel Particle Impactor (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 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 on the porous oiled impaction substrate, while smaller particles continue to the standard 37-mm collection filter for analysis.

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

See *PPI Performance on page 2*.

See *comparative performance graphs and references on page 2*.

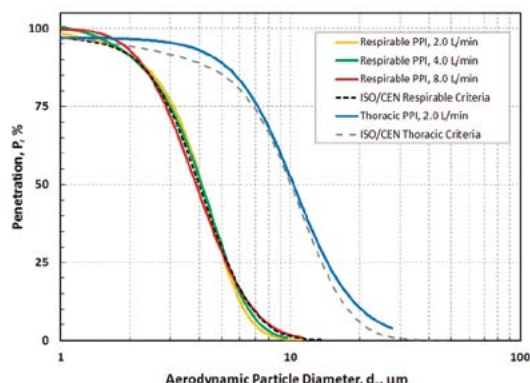


Reusable Parallel Particle Impactors (PPIs)

A Precise Match to ISO Dust Criteria

SKC PPI Performance

SKC PPI models were evaluated side by side with other size-selective samplers. Potassium sodium tartrate (PST), dioctyl phthalate (DP), glass spheres (GS), and coal mine dust were used as test aerosol. A load of approximately 6.8 mg of coal mine dust on the PPI substrates did not adversely affect PPI performance.



Comparison of PPI Samplers' performance with thoracic and respirable conventions

References

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

Reference 2 is an author-created, un-copyrighted version of an article accepted for publication in the *Journal of Physics: Conference Series 151*. IOP Publishing Ltd. is not responsible for any errors or omissions in this version of the manuscript or any version derived from it. The definitive publisher authenticated version is available online. Go to <http://dx.doi.org>, enter doi: 10.1088/1742-6596/151/1/012060.

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

Trakumas, S., "High-flow Personal Sampler to Monitor Exposure to Respirable Crystalline Silica at New Lower TLV," IOHA 2010 8th Conference Book of Abstracts, Rome, p. 59

Trakumas, S., Salter, E., "High-Flow Personal Sampler to Monitor Exposure to Respirable Crystalline Silica at New Lower TLV" PowerPoint Presentation

2013 OSHA Notice of Proposed Rule Making (NPRM), <https://www.osha.gov/silica/nprm.pdf>

ISO 7708:1995 (2008), *Air Quality — Particle Size Fraction Definitions for Health-related Sampling*, www.iso.org, search on 7708

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.skinc.com/warranty.asp>.

Performance Profile

Sampling Rate:	2 L/min respirable or thoracic, 4 L/min respirable, or 8 L/min respirable
Sample Pump:	Universal XR or AirChek® for 2 L/min, Leland Legacy® for 8 L/min
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
Tubing:	1/4-inch ID
Impaction Substrate:	Four 3/8-in diameter pre-oiled porous plastic discs
Analysis:	Gravimetric or chemical
Dimensions:	Height (clip to exhaust): 4.25 in (10.8 cm) Diameter: 1.8 in (4.6 cm) Depth: 1.2 in (3.0 cm)
Weight:	Aluminum: 3.3 oz (93.6 gm)

Ordering Information

Each PPI sample requires:

- 1 filter
- 1 support
- 4 impaction substrates

All items are available separately.



PPI Samplers, require filter, substrates, and support	Cat. No.
Thoracic PPI (blue), 2 L/min, aluminum	225-381
Respirable PPI (gold), 2 L/min, aluminum	225-380
Respirable PPI (orange), 4 L/min, aluminum	225-382
Respirable PPI (red), 8 L/min, aluminum	225-383

Recommended Collection Filters for PPI, required for sampling Select a filter based on your application.

PVC Filters, 37 mm, 5.0 μ m, pk/100	225-5-37
PTFE Filters,†§ 37 mm, 2.0 μ m, with laminated PTFE support, for metalworking fluids, NIOSH 5524, pk/50	225-27-07
MCE Filters, 37 mm, 0.8 μ m, 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, four 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, with non-serrated flat tips	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.

§ If using PTFE Filter Cat. No. 225-27-07 as specified in NIOSH 5524 for Metalworking Fluids, follow the procedure in NIOSH Draft Appendix for NIOSH 5524 at www.skinc.com/instructions/38030.pdf to mitigate problems with weight instability and subsequent high blanks following extraction. Failure to follow the procedure in the NIOSH Draft Appendix will result in invalid samples.

