

Disposable 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
- **Single use means no cleaning or two-way shipping costs!**
- **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:** Enhances sensitivity and can be used with personal pumps
 - **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
- **Patented* disposable PPIs are available pre-assembled with:**
 - **Filter and pre-oiled substrates** for chemical analysis
 - **Pre-oiled substrates only** – add your own weighed filter for gravimetric analysis
- **Reusable aluminum PPIs are available** (*see www.skcinc.com/prod/225-380.asp*)

New!
Disposable
conductive plastic!



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 at right*). In addition, PPI Samplers feature many advantages! *See below.*

The Disposable PPI Advantage

- Convenient single-use sampler eliminates assembly, cleaning, and two-way shipping costs
- Small size and light weight provides worker comfort, even under helmets or other PPE
- Choice of flow rates for maximum flexibility in pump options, sample duration, and contaminant concentration

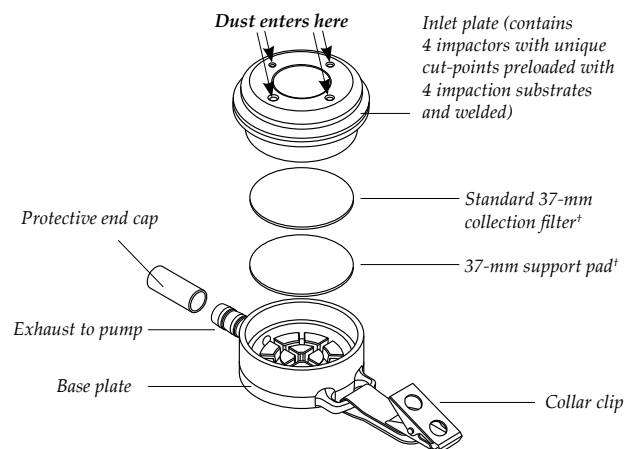
Respirable PPI Samplers Meet Requirements in OSHA NPRM for Silica

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



† User-installed on non-preloaded PPIs; available already installed with preloaded PPIs. See Ordering.

See comparative performance graph and references on page 2.



SKC Inc. 724-941-9701

SKC-West 714-992-2780

SKC Gulf Coast 281-859-8050

SKC South 434-352-7149

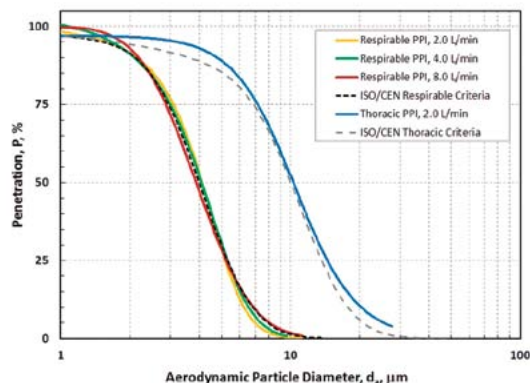
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A Precise Match to ISO Dust Criteria

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/silicalnprm.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 and 4 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 Method 5524) or 37-mm, 0.8- μ m MCE filter or 37-mm Quartz filter
Tubing:	1/4-inch ID
Impaction Substrate:	Four 3/8-inch diameter pre-oiled porous plastic discs (<i>preloaded in all Disposable PPIs</i>)
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:	Disposable: 1.1 oz (31.2 gm)
Shelf-life:	One year from date of manufacture

Disposable PPI Ordering Information

Disposable PPI Samplers**	Cat. No.
Preloaded Disposable PPI Samplers contain four porous plastic disc impaction substrates,* one 37-mm collection filter, and one 37-mm cellulose support	
Respirable PPI (red) , 8 L/min, plastic, with 5.0- μ m PVC collection filter	225-3841
Respirable PPI (orange) , 4 L/min, plastic, with 5.0- μ m PVC collection filter	225-3871
Respirable PPI (gold) , 2 L/min, plastic, with 5.0- μ m PVC collection filter	225-3851
Thoracic PPI (blue) , 2 L/min, plastic, with 0.8- μ m MCE collection filter	225-3861
Thoracic PPI (blue) , 2 L/min, plastic, with Quartz collection filter	225-3862
Non-preloaded Disposable PPI Samplers contain four porous plastic disc impaction substrates.* <i>Require collection filter and support; see below</i>	
Respirable PPI (red) , 8 L/min, plastic	225-384
Respirable PPI (orange) , 4 L/min, plastic	225-387
Respirable PPI (gold) , 2 L/min, plastic	225-385
Thoracic PPI (blue) , 2 L/min, plastic	225-386

Recommended Collection Filters for Non-preloaded 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
Quartz Filters , 37 mm, pk/100	225-1827

Filter Supports for Non-preloaded PPI, 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

Accessories	
Calibration Adapter for Disposable PPI	225-389
Forceps , stainless steel, with non-serrated flat tips	225-8371

[†] Back pressure on PTFE filters can vary within the same lot. ** Designed for one-time use
* Limited shelf-life

§ 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.