

# Disposable Parallel Particle Impactors (PPIs)

## Listed in the OSHA Silica Rule

- Collection efficiency precisely matches ISO 7708/CEN criteria adopted in the OSHA final silica rule
- Anti-static plastic
- 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 new lower OSHA PEL for silica
  - 4 L/min respirable PPI: Enhances sensitivity and can be used with personal pumps; TWA sampling for  $\geq 4$  hours
  - 2 L/min respirable PPI: 8-hour TWA sampling
- Disposable PPI Sampler Options
  - Preloaded with filter by SKC; also available with preweighed filters
  - Empty for filter loading by a laboratory or the user
  - All disposable PPI Samplers are preloaded with pre-oiled impaction substrates in the inlet section
- Reusable aluminum PPIs are available (*visit [www.skcinc.com](http://www.skcinc.com)*)
- Thoracic models are available (*visit [www.skcinc.com](http://www.skcinc.com)*)



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

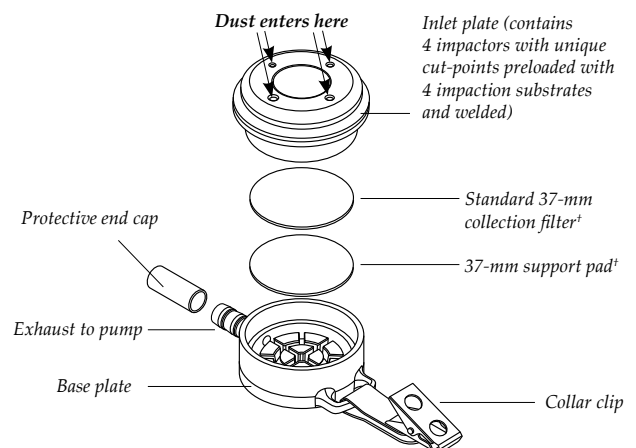
### PPI Samplers Meet Requirements in OSHA Final Rule on Respirable Crystalline Silica

In its final silica rule, OSHA set a new permissible exposure limit (PEL) of  $50 \mu\text{g}/\text{m}^3$  across all industries covered by the rule and abandoned the previous silica PEL formula. In addition, the OSHA final silica rule states that any sampler conforming to the ISO 7708/CEN criteria (50% cut-point of  $4 \mu\text{m}$ ) can be used for workplace silica and lists examples of samplers, including the impaction-based SKC PPI Samplers (final rule page 16439). The ISO 7708/CEN criteria have been adopted by NIOSH, ACGIH, and many other global occupational hygiene organizations. PPI sampler performance data, relative to the ISO 7708/CEN criteria, was published in the *Journal of Physics*, Conference Series 151, 2009 and was made part of the OSHA Docket used to develop the OSHA final silica rule.

### How PPI Works

Only the patented\* SKC 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 Information.

See comparative performance graph and references on back.



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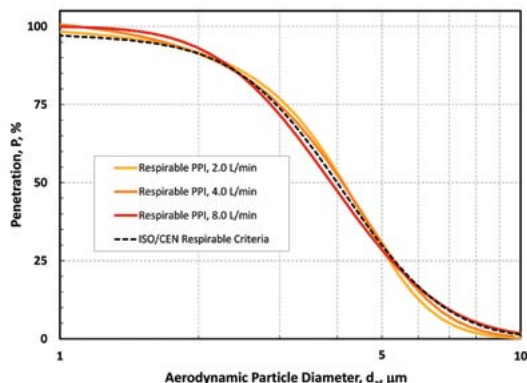


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### SKC PPI Performance

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 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,

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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

OSHA Final Rule on Respirable Crystalline Silica, [www.osha.gov/silica](http://www.osha.gov/silica)

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

Stacey, P., Thorpe, A., and Echt, A., "Performance of High Flow Rate Personal Respirable Samplers When Challenged with Mineral Aerosols of Different Particle Size Distributions," *Ann. Occup. Hyg.*, 60, 2016, pp. 479-492, <http://annhyg.oxfordjournals.org/content/60/4/479.full.pdf>

### Performance Profile

<b>Sampling Rate:</b>	2, 4, or 8 L/min respirable
<b>Sample Pump:</b>	Universal XR or AirChek® for 2 and 4 L/min, Leland Legacy® for 8 L/min
<b>Sample Time:</b>	Dependent on method used
<b>Sample Media:</b>	37-mm, 5.0- $\mu$ m PVC filter
<b>Tubing:</b>	¼-inch ID
<b>Impaction Substrate:</b>	Four ¾-in diameter pre-oiled porous plastic discs ( <i>preloaded in all Disposable PPIs</i> )
<b>Analysis:</b>	Gravimetric or chemical
<b>Body Material:</b>	Conductive ABS plastic
<b>Dimensions:</b>	Height (clip to exhaust): 4.25 in (10.8 cm) Diameter: 1.8 in (4.6 cm) Depth: 1.2 in (3.0 cm)
<b>Weight:</b>	1.1 oz (31.2 gm)
<b>Shelf-life:</b>	18 mos from date of manufacture

### Ordering Information

Disposable PPI Samplers*	Cat. No.
<b>Preloaded Disposable PPI Samplers</b> contain four porous plastic disc impaction substrates, one 37-mm collection filter, and one 37-mm cellulose support	
<b>Respirable PPI (red)</b> , 8 L/min, plastic, with 5.0- $\mu$ m PVC collection filter	225-3841
<b>Respirable PPI (orange)</b> , 4 L/min, plastic, with 5.0- $\mu$ m PVC collection filter	225-3871
<b>Respirable PPI (gold)</b> , 2 L/min, plastic, with 5.0- $\mu$ m PVC collection filter	225-3851
<b>Respirable PPI (gold)</b> , 2 L/min, plastic, with 1.0- $\mu$ m PTFE filter on polypropylene support, with pad	225-3852
<b>With Prewighed Filter</b>	
<b>Respirable PPI (red)</b> , 8 L/min, plastic, 5.0- $\mu$ m PVC filter preweighed to 5 decimals; unit supplied in tamper-evident inner bag	
<b>Respirable PPI (orange)</b> , 4 L/min, plastic, 5.0- $\mu$ m PVC filter preweighed to 5 decimals; unit supplied in tamper-evident inner bag	225-3841-PW
<b>Respirable PPI (gold)</b> , 2 L/min, plastic, 5.0- $\mu$ m PVC filter preweighed to 5 decimals; unit supplied in tamper-evident inner bag	225-3871-PW
<b>Respirable PPI (gold)</b> , 2 L/min, plastic	225-3851-PW
<b>User-loaded Disposable PPI Samplers</b> contain four porous plastic disc impaction substrates. <i>Require collection filter and support; see below</i>	
<b>Respirable PPI (red)</b> , 8 L/min, plastic	225-384
<b>Respirable PPI (orange)</b> , 4 L/min, plastic	225-387
<b>Respirable PPI (gold)</b> , 2 L/min, plastic	225-385
<b>Respirable PPI (gold)</b> , 2 L/min, plastic	pk/25 225-385A

Recommended Collection Filters for User-loaded PPI Sampler, required for sampling. Select a filter based on your application.	
<b>PVC Filters</b> , 37 mm, 5.0 $\mu$ m, pk/100	225-5-37
<b>MCE Filters</b> , 37 mm, 0.8- $\mu$ m pore size, pk/100	225-1939

Filter Supports for User-loaded PPI Sampler, required for sampling. Select either cellulose or stainless steel.	
<b>Support Pads</b> , cellulose, 37 mm, pk/100	225-27
<b>Stainless Steel Support Screen</b> , 37 mm, wide mesh	225-26

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

\* Designed for one-time use

Learn more at [www.skcinc.com](http://www.skcinc.com)!

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