



## High flow rate samplers quickly, reliably measure respirable silica in field tests

### **Silica Measurement with High Flow Rate Respirable Size Selective Samplers: A Field Study**

Taekhee Lee, Martin Harper, Michael Kashon, Larry A. Lee, Catherine B. Healy, Marie A. Coggins, Pam Susi and Andrew O'Brien. *Annals of Occupational Hygiene*, November 2015 (Published online ahead of print).

#### **Overview**

Researchers sampled airborne silica at thirteen occupational sites in the United States and Ireland, using both high and low flow rate cyclones, and compared results.

#### **Key Findings**

- High flow rate samplers showed less than a 30% difference in measured respirable dust mass concentration and quartz mass concentration than low flow rate samplers when outliers (ratio  $<0.3$  or  $>3.0$ ) were removed from the analysis.
- However, low flow rate samplers may pose problems both with regard to accurate measurement of silica at low airborne concentrations over short sampling durations and calibration (e.g. a cumbersome jar must be used to calibrate 10 mm nylon cyclones).
- The high flow rate samplers allow for greater respirable quartz mass collection over shorter sampling periods affording improved levels of precision. Size-selective high flow rate samplers can reliably quantify silica concentrations below  $.025\text{mg m}^{-3}$  even in sampling periods  $<4$  hours.
- Cost, size and weight of both sampler and pump may limit use of high flow rate samplers for routine personal sampling.
- Moderate flow rate cyclones such as the GK2.69 cyclone may represent a good middle ground offering sufficient flow rate to measure concentrations at one half  $0.025\text{ mg/m}^{-3}$  over a 4 hour sample with use of lower weight and lower cost pumps already commonly used for field sampling.

#### **For more information, contact:**

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#### **See abstract:**

<http://bit.ly/1YfTccY>

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